A STUDY TO EVALUATE THE EFFECTIVENESS OF STRETCHING EXERCISE IN REDUCTION OF LOW BACK PAIN AMONG STAFF NURSES WORKING IN A SELECTED HOSPITALS, KANYAKUMARI DISTRICT

DISSERTATION SUBMITTED TO

THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITYCHENNAI

IN PARTIAL FULFILLMENT OF REQUIREMENT FOR THE

AWARD OF DEGREE OFMASTER OF

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Internal Examiner External Examiner

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APPROVED BY DISSERTATION COMMITTEE ON ……

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Dissertation Submitted to

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI

In partial fulfillment of requirement for the award of degree of

MASTER OF SCIENCE IN NURSING,

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BONAFIDE CERTIFICATE

This is to certify that the dissertation entitled **"A STUDY TO EVALUATE THE EFFECTIVENESS OF STRETCHING EXERCISE IN REDUCTION OF LOW BACK PAIN AMONG STAFF NURSES WORKING IN A SELECTED HOSPITALS, KANYAKUMARI DISTRICT"** is a bonafide research work done by **Miss.Anisha R II year M.Sc Nursing**, Global college of nursing, Nattalam under the guidance of **Mrs. Rosalind Immanuel, M.Sc (N), Vice principal,** Global college of nursingin partial fulfillment of the requirement for the degree of master of science in Nursing under the Tamil Nadu Dr.M.G.R University, Chennai.

Place: Nattalam

Date:

Signature

Principal

GlobalCollege of Nursing

Nattalam

DECLARATION

I hereby declare that the present dissertation titled **"A STUDY TO EVALUATE THE EFFECTIVENESS OF STRETCHING EXERCISE IN REDUCTION OF LOW BACK PAIN AMONG STAFF NURSES WORKING IN A SELECTED HOSPITALS, KANYAKUMARI DISTRICT"** is the outcome of the original research work under taken and carried out by me under the guidance of **Mrs. Rosalind Immanuel M.Sc (N) Vice principal,** Global college of Nursing Nattalam. I also declare that the material of this has not formed in any way, the basis for the award of any degree or diploma in this university or any universities.

Place: Nattalam

Date :

Name: R. Anisha

II year M.Sc. (N)

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Investigator

ABSTRACT

Introduction

Low back pain is neither a disease nor a diagnostic entity of any sort. The term refers to pain of variable duration in an area of the anatomy afflicted so often that it is has become a paradigm of responses to external and internal stimuli.

Statement of the problem

A study to evaluate the effectiveness of stretching exercise in reduction of low back pain among staff nurses working in a selected hospitals, Kanyakumari district.

Objectives of the Study

1) To assess the pre test and post test level of low back pain among staff nurses in experimental group and control group.

2) To find out the effectiveness of stretching exercise on low back pain among staff nurses in experimental and control group.

3) To associate the pre test level of low back pain among staff nurses in experimental and control group with their selected demographic variables.(Age, Sex, Educational status, unit, marital status, clinical experience)

The investigator adopted Callista Roy's Adaptation Model (1984) as the conceptual frame work for this study. Quasi experimental research design Was used and the formal consent was obtained from P.S. Medical Trust Hospital Thalakkulam and the investigator selected 60 samples using Purposive sampling technique were selected, as a samples both in experimental group and control group .

Descriptive and inferential statistics were used to analyze the data. Analysis of demographic variables was done in terms of frequency and percentage distribution. Comparison of post test level of low back pain between the experimental group and control group was analyzed by 't' test which is an inferential statistical analysis. Association of pre test level of low back pain in the experimental group and control group with demographic variables was analyzed by using chi-square test.

The study revealed that among experimental group the mean pre-test score was 27.3 with standard deviation 7.29. The mean post-test was 16.6 with standard deviation 5.37. The mean difference was 10.7. The obtained 't' test value was 17.63,which was significant at $p< 0.05$ level.

Hence it was inferred that stretching exercise was highly effective in reducing of low back pain among staff nurses with low back pain.

CHAPTER-1

“If you don’t keep moving, it’s easy to get locked into a downward spiral”.

(Olaya-Contreras from Daily Express)

INTRODUCTION

Background of the study

The lower back is a complex of bones, ligaments, muscles and tendons and nerves that together are amazingly adaptable to a wide range of movement and function. It forms the infrastructure of a biological machine that anchors the kinetic chain and transfers bio mechanical forces in to coordinated functional activities. The spine acts as a conduit for precious neural structures and possess the physiological capacity to act as a crane for lifting and a crankshaft for walking. But the complexity of this region is also why it is quite vulnerable to injury, considered by scientists an example of incomplete evolution of the species. Modern civilization has done us few favours in how we sit at desks and in car seats for extended periods of time, which tends to tighten the muscles and other softer tissues (tendons) in to one position (Back Pain Myths, 2010).

Low back pain refers to pain associated with some type of activity that causes undue stress on the tissues of the lower back. Low back pain is at epidemic levels in india and it is one of most common afflications in our society. It is the leading reason for physician office visits, hospitalization, and surgery, and work disability (S.Sridevy.Nightingale Nursing Times, 2008).

The worldwide incidence of low back pain (LBP) ranges from one percent to five percent, and lifetime prevalence ranges from 13% to 78%. The annual rate of occupational low back pain is about two percent and the annual incidence is five

percent. The recurrent episodes of low back pain range from 60 to 85%. Acute low back pain is one of the leading reasons for all physician visits.Many recent surveys in Spain found that the most common work-related physical problems derived mainly from maintaining same posture and carryingout repetitive tasks. The survey results showed that about 40.9% of workers were having low back pain. In India also the prevalence rate of low back pain is high among the working population. According to the statistical data, a total of 23.09% people are suffering from low back pain, out of that 57% are working population.

World health organization estimates that around 52% of population suffer from low back ache according to 2003 statistics. According to national health survey (2001) 6 million around country suffer from back pain. The life time prevalence of an episode of significant low back pain is 60% to 90%.

Low back pain can arise from many causes. It can range from a dull annoying ache to absolute agony. Most women suffer from non-specific low back pain than men. Increasing age, heavy physical work, heavy lifting are the common predisposing factors.Mechanical lumbar symptoms are typically aggravated by static loading of the spine (prolonged sitting or standing) by long level activities (Health Grade Medical Statistics Centre, Mumbai).

Conditioning through flexibility and strengthening back exercise can help relieve the pain of many back conditions. It strengthens the spinal column and the supporting muscles, ligaments and tendons. Most of the back exercises focus not only on the back, but also the abdominal muscles and gluteus and hip muscles. These strong core muscles can provide back pain relief because they provide strong support for the spine, keeping it in alignment and facilitating movements that extend the

spine. It is very necessary to provide exercise as one of the nursing interventions to reduce low back pain (Peter F Ullrich, 2009).

Proper care with regular exercise is required to have a strong and powerful back. Many back strengthening exercises will help to strengthen the spinal column and supports muscles, ligaments and tendons. Most of these back exercises focus not only on the back but also abdominal muscles and gluteus and hip muscles. Just like reinforced steel can bear more weight than sheet aluminum, a strong, well-conditioned back can withstand more stress and protect the spine, that has been conditioned through exercise

Need for the study

SandulYasobant, ParamasivanRajkumar (2014). A cross-sectional and observational study was conducted to assess the Work-related musculoskeletal disorders among health care professionals in, India. It was a cross-sectional study conducted among dentists, laboratory technicians, nurses, physicians, and physiotherapists of various clinical departments in a tertiary care hospital in Chennai, India, from January to June 2013.Among all the health care professionals assessed in this study, nurses were found to be at the highest risk, whereas physicians were at the lowest risk.

According to survey (Deepak B. Anap 2013) Work related musculoskeletal disorders among hospital nurses in Maharashtra, India Nurses have one of the highest rates of musculoskeletal disorders of any occupation validated questionnaires were distributed to 250 nurses working rural hospitals across Maharashtra but only 228 questionnaires were returned and 212 complete questionnaires were included for study. On Analysis we found that 89.1% nurses had experienced work-related

musculoskeletal pain or discomfort at some time in their occupational lives. WMSDs was highest in the low back (48.2%), followed by the shoulder (34.6%), neck (33.1) and knee (29 %). Other regions with less prevalence were Thoracic (10.5%), Feet and ankle (7.6%), Elbow (1.88%) and Hip (1.6 %). Priority was given to getting help to handle heavy patients (57.1%), nursing procedure modification in order to avoid stress injury (50.2 %) coping strategies.

According to Bureau of labour statistics 1998 in USA, 12 out of 100 nurses in hospitals, and 17.3 out of 100 nurses working in nursing homes reported work related musculoskeletal injuries, including back injuries, which is about double the rate of all industries combined. The Bureau of labour statistics of 2007 states that 17% of nurses had back pain and there is 40-50% of chance that the nurse will have back pain in a given year .Up to 80% chance that the nurse will have back pain in his /her life time.

A descriptive cross sectional study to assess the prevalence of low back pain and knowledge on body mechanics among the staff nurses was conducted in Jawaharlal institute of postgraduate medical education and research (JIPMER), india 2015. The cross sectional study in which convenience sampling technique was used to select 384 staff nurses. Among 384 staff nurses 285 (74.2%) nurses had low back pain. Among the low back pain cases, 18 (4.7%) cases were diagnosed by exercises and 15 (3.9%) cases were on regular treatment. Severe pain was found among 16 (4.2%) samples. 162 (42.2%) staff nurses experienced pain on lumbar region. Even though nurses had good knowledge on body mechanics they rarely follow it. Appropriate interventions at initial stages can reduce the incidence of low back pain. Hence can improve the quality of life of nurses.

According to KhwairakpamZhimina Devi (2014) effectiveness of muscle stretching in occupation related chronic mechanical low back pain among community nurses in K.T.G Hospital, Bangalore, India. Stretching of lower back muscle an immediate effect on chronic lower back pain. 40 subjects with chronic mechanical low back pain randomized 20 subjects into each Study and Control group. Control group received placebo stretching while Study group received stretching of Lower Back Muscle. Analysis using RMANOVA found that there was a statistically significant ($p<0.05$) greater percentage of improvement

According to Vicki Contie (2011)results suggest that both yoga and stretching can be good, safe options for people who are willing to try physical activity to relieve their moderate low back pain" Sherman says. She adds that it's important for classes to be taught by instructors who can tailor the difficulty and adjust stretches and postures to accommodate participants physical limitations.

Since I worked as a staff nurse for two years in hospital, most of the staff complaining of back pain. That's why I selected this topic as my research.

Several researches have done on effectiveness of exercise therapy on low back pain and found effective and cost beneficial along with improvement in quality of life. Hence the investigator got interested in finding out the effectiveness of stretching exercise among staff nurses with low back pain.

STATEMENT OF THE PROBLEM

A study to evaluate the effectiveness of stretching exercise in reduction of low back pain among staff nurses working in a selected hospitals, Kanyakumari district.

OBJECTIVES OF THE STUDY

1) To assess the pre test and post test level of low back pain among staff nurses in experimental group and control group.

2) To find out the effectiveness of stretching exercise on low back pain among staff nurses in experimental and control group.

3) To associate the pre test level of low back pain among staff nurses in experimental and control group with their selected demographic variables.(Age, Sex, Educational status, unit, marital status, clinical experience)

HYPOTHESIS

H1: There will be a significant difference between pre test and post test level of low back pain in the experimental and control group.

H2: There will be a significant difference between the post test level of low back pain among staff nurses in experimental and control group

H3: There will be a significant association between pre testlevel of low back pain with the selected demographic variables.

OPERATIONAL DEFINITION

Evaluate

To judge or determine the significance, worth, quality or form an idea.

In this study, Evaluate is to determine the result of stretching exercise to reduce low back pain among staff nurses.

Effectiveness

The ability to produce of specific result or to exert a specific measurable influence

In this studyeffectiveness is the extent to which the level of low back pain is reduced as a result of administering stretch exercises among staff nurses.

Stretching exercise

The activity of straightening the arms and legs, and tightening the muscles.

It is the process of placing particular parts of the body into a position that will lengthen, or elongate, the muscles and associated soft tissues.

Low back pain

Low back pain is pain, Muscle tension, or stiffness localized below the costal margin and above the inferior gluteal folds, with or without sciatica.

In this study was to examine the effectiveness of a stretching exercise program (SEP) on low back pain (LBP) and exercise self-efficacy among nurses

Assumption

The study assumed that

- nurses may have severe low back pain
- perception of pain may vary from person to person
- low back pain can be reduced through stretching exercise

Delimitations

The study is delimited to

- 4 weeks.
- sample of 30 in each experimental and control group
- selected hospitals, Kanyakumari district.

ETHICAL CONSIDERATION

- The study was conducted after the approval from research and ethical clearance committee of Global College of Nursing.

- Formal approval from the directors of PPK and PS Medical Trust Hospital.
- Written informed consent was obtained from each participants and parents of the child.

CONCEPTUAL FRAME WORK

The conceptual frame work adopted for the present study is based on Lydia. E. Hall's Core, Care and Cure model (1994). She considered a basic philosophy of nursing upon which the nurse may base nursing care. As a nurse theorist, Lydia. E. Halls is unique in that her beliefs in nursing were demonstrated in practice. Hall presented her theory of nursing visually by drawing three interlocking circles ie, core, care, and cure. The three aspects are interrelated and influenced by each other. Nursing has major role in these three aspects.

Core circle of nursing care is based on the concept that nurses looks at and explore feeling regarding his or her current health status and potential changes ie, core circle deals with nurses problems. In the present study core part deals with low back pain experience by age group of 20 to 60 years.

Care circle presents the nurturing component ie, the concept of mothering (care and comfort of nurses) and provide for teaching, learning activities in this study care circle includes the demonstration of back strengthening exercises and post test assessment level of pain.

Cure circles of nurse care is the evaluation of the pathological and therapeutic sciences applied by the health team members. In this study, cure part deals with response of the care provided for the study subjects by the researcher. ie, reduction in the level of back pain.

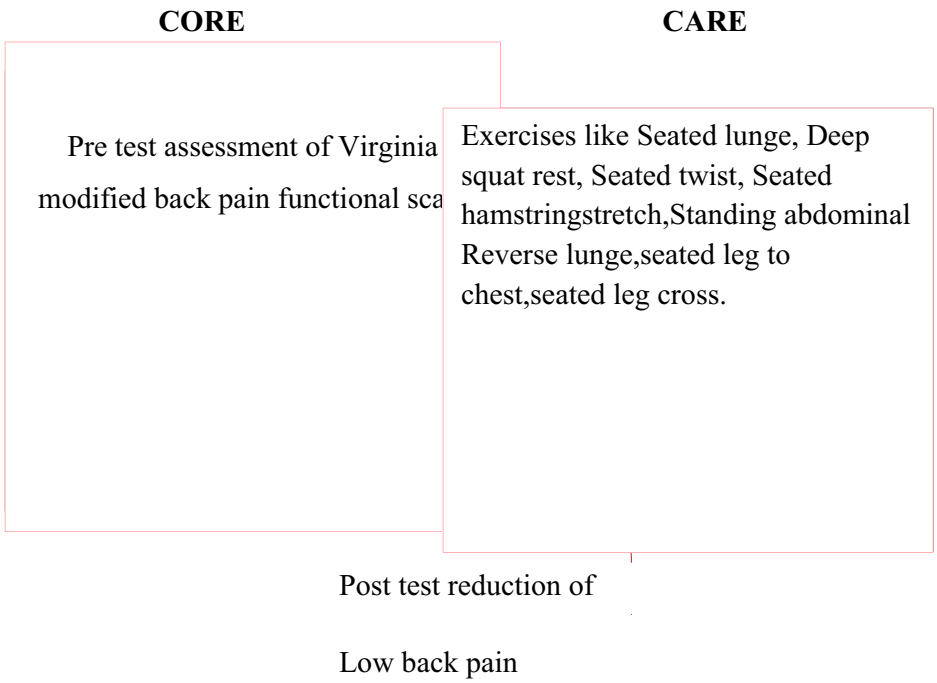


Fig. 1. Conceptual Frame Work based on Lydia. E. Hall core, care, cure Model.

CHAPTER –II

REVIEW OF LITERATURE

A review of related literature gives an insight into the various aspects of the problems under study. The review serves as an integrated function that facilitates the accumulation of knowledge. Hence, review of literature is important to research in order to know what has been established and documented (Pilot & Hunger,1991). The literature review in the present study is organized under the following sections.

Section A: Studies and literature related to stretching exercise

Section B: Studies and literature related to low back pain

Section C: Studies and literature related to stretching exercise to reduce low back pain among staff nurses

Section A: Studies and literature related to stretching exercise

Rattaporn Sihawong, et al (2014) A study conducted in healthy office workers with lower than normal trunk extension flexibility .Healthy office workers ($n = 563$) were randomly assigned at the cluster level into either intervention ($n = 282$) or control ($n = 281$) groups. Participants in the intervention group received daily stretching exercise.. Those in the control group received no intervention. Over the 12-month follow-up, 8.8 % of participants in the intervention group and 19.7 % in the control group developed incidence of low back pain. An exercise program consisting of muscle stretching is an effective intervention to reduce incident low back pain for office workers.

Volpato CP, et al. (2014) conducted a study to compare the effects of stretching and strengthening of the iliopsoas muscle associated with segmental stabilization versus stabilization alone, in the treatment for low back pain. Fourteen patients were randomized into three groups. The first group was given only segmental stabilization training the second was submitted to stabilization training and stretching of the iliopsoasmuscle, and the third was given stabilization training and strengthening of the iliopsoas. The group ST (p = 0.006) and ST-Strength (p=0.092) showed significant improvement in the Visual Analog scale. The extension flexibility showed statistically significant improvement in the group stabilization training strength group (p=0.038).

Chen HM ,et.al (2012) conducted a study to examine the effectiveness of a stretching exercise program on low back pain and exercise self-efficacy among nurses in Taiwan. A total of 127 nurses, who had been experiencing low back pain for longer than 6 months and had low back pain with pain scores greater than 4 on the Visual Analogue Scale for Pain , were randomly assigned to an experimental group and a control group. The experimental group (n = 64) followed an stretching exercise program, whereas the control group (n = 63) was directed to perform usual activities for 50 minutes per time, three times a week. In addition, the experimental group showed significantly higher exercise self-efficacy than did the control group at the fourth and sixth months. A total of 81% of the participants in the experimental group reported a moderate to high level of low back back pain relief. Stretching exercise program is an effective and safe non pharmacological intervention for the management of low back pain.

Karen J Sherman, **et.al (2010)** conducted a study to assess whether yoga is effective for treating chronic low back pain compared with self care and stretching

exercise. A total of 210 participants with low back pain lasting at least 3 months will be recruited from primary care clinics of a large healthcare system based in Seattle. They will be randomized in a 2:2:1 ratio to receive 12 weekly yoga classes, 12 weekly conventional stretching exercise classes of comparable physical exertion. In addition, data will be collected on physical measurements at baseline and 12 weeks and saliva samples will be obtained at baseline, 6 and 12 weeks. The effectiveness of yoga will be assessed using analysis of covariance within an intention to treat context. This study will provide the clearest evidence to date about the value of yoga as a therapeutic option for treating chronic back pain.

Cunha AC, Burke TN,et.al (2008) conducted a study to compare the effect of conventional static stretching and muscle chain stretching, as proposed by the global posture reeducation method, in the manual therapy of patients with chronic back pain. Thirty-three female patients aged 35 to 60 years old, 31 of whom completed the program, were randomly divided into two groups: The global posture reeducation group (n=15) performed muscle chain stretching, while the conventional stretching group (n=16) performed conventional static muscle stretching. Both groups also underwent manual therapy. Data's were statistically analyzed at a significance level of $p<0.05$. Conventional stretching and muscle chain stretching in association with manual therapy were equally effective in reducing pain and improving the range of motion and quality of life of female patients with chronic back pain.

Moreno MA, Catai AM, et al (2007) conducted a study to evaluate the effect that respiratory muscle stretching using the global postural reeducation (GPR) method in sedentary young males. This was a randomized study involving 20 sedentary volunteers, aged 22.7 +/- 2.5 years, divided into two groups. A control group,

composed of subjects not performing any exercises, and a group of subjects submitted to the global postural reeducation method. The initial and final values showed no significant differences ($p > 0.05$). However, for the global postural reeducation group, all values increased after the intervention ($p < 0.05$). Respiratory muscle stretching using the GPR method was efficient.

Peltonen JE, et al (2006) conducted a study on "stretching exercise" and foundthe association between physical training, low back extensor and psoas muscle cross-sectional areas and strength characteristics of trunk extension and flexion were studied in adolescent girls. A group of athletes (n = 49) (age range 13.7-16.3 years) consisting of gymnasts, figure skaters and ballet dancers was age matched with non-athletes (n = 17) who acted as a sedentary control group. When cross-sectional areas were adjusted with body mass, the athletes showed significantly greater. The athletes also had a greater absolute psoas muscle cross sectional areas ($P < 0.01$) and trunk flexion force ($P < 0.01$) compared to the controls. When the forces were expressed relative to body mass, the athletes were superior both in trunk flexion ($P < 0.001$) and extension ($P < 0.001$). There was a significant correlation between muscle cross-sectional areas and strength parameters, but the force per muscle cross sectional areas did not differ significantly between the athletes and the non-athletes ($P < 0.05$).

Tarek M. Phd, et al (2005) conducted study that the effectiveness of the stretching exercise program on who suffering from chronic low back pain patients at the University of Miami. Twenty eight chronic low back pain patients were randomly assigned to one of two groups. The control group underwent a multimodal rehabilitation program, and the experimental group underwent the same rehabilitation program in addition to the systematic stretching maneuver under investigation. The results obtained showed that patients undergoing the multimodal rehabilitation

program with and without the proposed systematic stretching maneuver showed a significant improvement in their functional abilities. Also, a significant decrease in their pain level.

Section B: Studies and literature related to low back pain

Naser Sharafkhani, et al (2014)conducted a study to evaluate the nurses educational needs based on the Health Belief Model (HBM) with focus on the low back pain and adoption of preventive behaviors. This cross sectional study was conducted on 133 nurses who were selected randomly from three public educational hospitals affiliated with Arak University of Medical Sciences. Moreover, there was a significant relationship between the nurses performance on adopting the preventive behaviors ($p < .05$). In this study a significant relief of low back pain ($p<.05$) is observed

Ajimsha MS, et al (2014) conducted a study on Effectiveness of Myofascial release and specific back exercises among nursing professionals in Kerala, India. In this study 80 Nursing professionals with chronic low back pain.The simple main effects analysis showed that the Myofascial release group performed better than the control group in weeks 8 and 12 ($P < 0.005$). The proportion of responders, defined as participants who had at least a 50% reduction in pain between weeks 1 and 8, was 73% in the Myofascial release group and 0% in the control group, which was 0% for functional disability in the Myofascial release and control group.This study provides evidence that Myofascial release when used as an adjunct to specific back exercises is more effective than a control intervention for chronic low back pain in nursing professionals.

Christiana D. Hinmikaiye, et al (2012) conducted a study to determine the incidences of low back pain among theatre nurses in university of Ilorin and ObafemiAwolowo university Teaching hospitals. A structured questionnaire was the tool of data collection. A total of 80 nurses participated in the study. 57 (78.1%) respondents experienced the first episode of back pain after commencing nursing, more females (70%) than males (30%) were employed. It can be seen that about 44 out of 57 subjects who had experienced back pain in their career experienced it at least once a month or more frequently. 64.91% subjects rated their pain as moderate pain. The largest single category was 'low back', with 77.19% of the 57 analyzable responses. 34 respondents said they Lift patient within bed without assistance.The high incidence of back pain is brought about by factors which seem to be entirely preventable. It was therefore concluded that the prevalence rate of 78.1% is high and efforts should be made by the nurses, ministry of health and the country at large on how to reduce the prevalence rate.

June KJ, Cho SH, (2011) conducted a study to examine the relationship of low back pain prevalence The study sample included 1345 nurses in 65 intensive care units in 22 South Korean hospitals. The mean age of nurses was 27.2 years. Overall, 90.3% of nurses had back pain at least once a month. Only 18.3% had received medical treatment for their back pain. Compared with neonatal intensive care unit nurses, who had the lowest prevalence, nurses in other specialties, excluding paediatric intensive care units, had a greater likelihood of back pain. Specialty medical intensive care unit nurses had the greatest probability of back pain and treatment. Perceiving staffing as inadequate and working 6 or more night shifts per month were related to a 64% increase and 48% increase in back pain, respectively. Nurses with 2-4 years of working experience in intensive care units had

the greatest probability of back pain and treatment.A high prevalence of back pain was found in intensive care unit nurses, even though they comprise a very young workforce in Korea.

Sikiru L, Shmaila H. (2009) conducted a study on Prevalence and risk factors of low back pain among nurses in AfricaFive hundred and eight respondents (178 [35%] males and 330 [65%] females) participated in the study. The 12 month prevalence of low back pain (LBP) was 360 (70.87%). LBP was more prevalent among female nurses (67.5%) than the male nurses (32.5%). The prevalence of LBP was highest among nurses in Obstetrics and Gynecology Unit (26.67%) and least among tutors (4.17%).There was no significant difference between Nigeria and Ethiopian nurses' responses in prevalence, etiology and knowledge of back care. There was a significant association between gender, knowledge of back-care ergonomics and prevalence of LBP at $p< 0.05$.It was concluded that poor back care ergonomics, duty stress and unavailability of lifting equipments are the major predisposing factors of LBP among nurses in Africa.

Karahan A, et al (2009) conducted a study conducted to describe the prevalence and risk factors for lower back pain amongst a variety of Turkish hospital workers including nurses, physicians, physical therapists, technicians, secretaries and hospital aides. A 44-item questionnaire was completed by 1600 employees in six hospitals associated with one Turkish university using a cross-sectional survey design. Data were collected over nine months from December 2005 to August 2006. Most respondents (65.8%) had experienced low back pain, with 61.3% reporting an occurrence within the last 12 months. The highest prevalence was reported by nurses (77.1%) and the lowest amongst secretaries (54.1%) and hospital aides (53.5%). In the majority of cases (78.3%), low back pain began after respondents started working in

the hospital, 33.3% of respondents seeking medical care for 'moderate' low back pain while 53.8% (n = 143) had been diagnosed with a herniated lumbar disc. Age, female gender, smoking, occupation, perceived work stress and heavy lifting were statistically significant risk-factors when multivariate logistic regression techniques were conducted ($P < 0.05$). Preventive measures should be taken to reduce the risk of lower back pain, such as arranging proper rest periods, educational programmes to teach the proper use of body mechanics and smoking cessation

I Maul, et.al (2003) A longitudinal study was performed with a follow up at 1 and 8 years among 269 nurses employed by a large university hospital in Switzerland. A modified version of the Nordic Questionnaire was distributed to obtain information about demographic data, occupational activities, and various aspects of LBP. Result showed that the LBP was highly prevalent with an annual prevalence varying from 73% to 76%. A large percentage (38%) indicated the same intensity of LBP on all three occasions. The proportion of nurses reporting repeated increase of LBP (19%) was approximately as large as the proportion who complained about repeated decrease of LBP (17%).

Hofmann F, et.al (2002) conducted a study on work-related low-back disorders in German nurses. A sample of 3,332 nurses and 1,720 clerks as reference group was investigated by a questionnaire. In this article, final results referring to a sub-sample of 2,207 nurses and 1,177 clerks who had always worked in their profession, so that we could exclude confounding effects of former occupations, will be presented. Excluding the confounding effects of several covariates by logistic regression, we computed relative risks for different pain symptoms. The data suggest a considerably higher risk of low back pain for nurses than for the reference population of clerks. Results, however, differ markedly when specific pain symptoms

are considered. With respect to lumbago-sciatica and sciatica - which have to be regarded as indicators for possible disc herniation - the study group's relative risk is the most elevated (2.88 for point prevalence of lumbago-sciatica/sciatica). Adjusting the results for several confounders and covariates leads to still higher estimations of nurses' relative risk.

Yip Y (2001) conducteda study of work stress, patient handling activities and the risk of low back pain among nurses in Hong Kong. A cross-sectional study of Hong Kong hospital nurses was conducted. Three hundred and seventy-seven nurses were recruited from six district hospitals. They were registered nurses or enrolled nurses working full-time for at least 1 month in the current ward. One hundred and seventy-eight (47.2%) study subjects were randomly selected from two district hospitals and 199 (52.8%) study nurses made up the convenience sample. Of the 377 nurses interviewed, 153 (40.6%) reported having LBP within the last 12 months. The results indicate that an association exists between work stress, manual lifting and LBP prevalence. Good posture and correct transferring techniques in ward situations should be reinforced with hands-on practice performed on nurses' common types of clients.

Section C: Studies and literature related to stretching exercise to reduce low back pain among staff nurses

Tiina Freimann, et al (2015) conducted a study was to investigate the effects of a home-exercise therapy programme on cervical and lumbar range of motion among intensive care unit nurses at Tartu University Hospital (Estonia). Thirteen nurses who had suffered musculoskeletal pain episodes in the neck and or lower back during the previous six months underwent an 8-week home-exercise therapy programme. Eleven nurses without musculoskeletal pain formed a control group.

Questions from the Nordic Musculoskeletal Questionnaire and the 11-point Visual Analogue Scale were used to select potential participants for the experimental group via an assessment of the prevalence and intensity of musculoskeletal pain. After the home-exercise therapy, there was a significant increase ($p < 0.05$) .Cervical range of motion in flexion was significantly higher ($p < 0.01$) in the experimental group compared to the control group after therapy. Our results suggest an 8-week intensive home-exercise therapy programme may improve cervical and lumbar range of motion among intensive care nurses.

Li-Ying Lin, RN, MSN, Ruey Hsia Wang, RN, PhD, (2015) conducted a study that examined the effects of stretching exercise intervention on nurses' low back pain. Using a pretest and posttest two-group design, a total of 60 female staff nurses employed by a medical center in Taiwan were selected by convenience sampling. Participants in the experimental group ($N = 30$) practiced stretching exercises while experiencing low back pain. The participants in the control group ($N = 30$) managed their back pain as usual. Decrease in low back pain intensity of the experimental group was significantly larger than that of the control group. Stretching exercises is an effective method for treating low back pain

Deok JuKim, MiLim Cho, et al, (2015) conducted a study investigated the effect of an exercise program for posture correction on musculoskeletal pain. [Subjects] Between September 2, 2013 and November 3, 2013, an exercise program was performed in 88 students from S University in K city (male students, n = 34; female students, n = 54). The exercise program for posture correction was performed for 20 minutes per session, 3 times a week for 8 weeks. Pain levels were measured using a pain scale, and pain levels before and after the exercise program were compared. Overall, pain levels of the participants were lower after the exercise

program than before the program, and significant differences in pain levels were noted in the lower back. So in this study low back pain was relieved with the exercise program.

Pillastrini P, Bonfiglioli R, et al (2013) conducted a study to determine the effect of a multimodal group program (MGP) on pain and disability in a sample of hospital workers with persistent low back pain. The study focused on 109 workers suffering from persistent low back pain with or without radiating pain. 62 nurses and 47 blue collars not involved in health care. The multimodal group program consisted of six group sessions including supervised exercises, an at-home program and ergonomic advice.Moreover, about a third of the subjects showed clinically significant improvement.

Melinda Jaromi, Andrea Nemeth, et al (2012) Conducted the study was to measure the effectiveness of a spine training programme in nurses who have been living with chronic low back pain. The study was carried out at the University of Pecs, Faculty of Health Sciences from 2007 to 2008 involving 124 nurses with low back pain. Participants were randomly assigned to the study group with an intervention conducted once a week for a six-week period. The pain intensity was investigated with the Visual Analogue Scale. The statistical analysis of repeated measures indicated a significant decrease in back pain intensity after the therapy in both groups, compared with measurements before the therapy. After the therapy in the BS group showed significant improvements over the control group; during the follow-up, the difference was still significant, yet slightly reduced. This study has shown that a significant reduction in the pain intensity and improvement in body posture.

Huei-Mein Chen, et al (2012) conducted a study to examine the effectiveness of a stretching exercise program on low back pain and exercise self-efficacy among

nurses in Taiwan. A total of 127 nurses, were randomly assigned to an experimental group and a control group. The experimental group (n = 64) followed an stretching exercise program, whereas the control group (n = 63) was directed to perform usual activities for 50 minutes per time, three times a week. Data were collected at four time points: at baseline, and 2, 4, and 6 months after the intervention. During the 6-month follow-up, the experimental group had significantly lower Visual Analog scale scores than did the control group at the second, fourth, and sixth months. In addition, the experimental group showed significantly higher exercise self-efficacy than did the control group at the fourth and sixth months. A total of 81% of the participants in the experimental group reported a moderate to high level of low back pain relief. The findings can be used to enhance self-care capabilities with low back pain for nurses that experience low back pain or are vulnerable to such work-related pain. stretching exercise program is an effective and safe non pharmacological intervention for the management of low back pain.

Rosanna M. Gartley, et al (2011) conducted a pre-shift stretching protocol to reduce employee injuries was initiated at a beverage company and a tin mill in the northeastern United States. The primary goal of this study was to determine the effects of a pre-shift stretching program on work-related musculoskeletal injuries. A secondary goal was to evaluate daily participation compliance during the 90-day program. Data on employee injuries during the stretching program were collected and compared to injury events during the same time period 1 year earlier. Comparison to injury events of the total eligible population during the study time frame was also included. Results of this pilot program in terms of injury rate reduction and participant compliance are promising. Study results may be useful for employers considering

implementing similar programs and also suggest the need for further study in this area.

Hiroharu Kamioka, Hiroyasu Okuizumi, et al (2010) conducted a study on stretching exercise for pain-relieving and patient education is well documented for chronic lumbago patients, it is uncertain how effective on-the-job training (OJT) is for female caregivers in nursing homes. Eighty-eight female caregivers volunteered to participate in this study, and they were separated into two groups randomly. Stretching exercises for only 6 min every day were recommended for low back pain prevention to the caregivers. A total of 29 (33%) participants withdrew by 12 weeks. Regarding the reasons for withdrawal, 28 participants resigned, and one took a leave of absence due to exacerbation of lumbago. Adherence to the stretching exercises was 2.3 ± 1.3 (mean ± SD) times per week. There is significant differences between control and experimental group. So this stretching exercise is effective to reduce low back pain.

SeonAe Yeo, RNC, et al (2010) conducted a study to explore the relationships among stretching exercise, Heart rate and pulse pressure were longitudinally examined in this secondary data analysis among women who engaged in stretching exercise daily from 18 weeks of gestation to the end of pregnancy compared with women who did walking exercise daily during the same time period. A total of 124 women were randomized to either stretching (n=60) or walking (n=64) in the parent study. Heart rates in the stretching group were consistently lower than those in the walking group. Based on the results of this secondary data analyses, a physiologic framework for possible beneficial effects of stretching exercise by enhancing autonomic responses on reducing risks for preeclampsia is proposed and discussed.

Neusa Maria C Alexandre , et al (2001)evaluate the effectiveness of a program designed to reduce back pain in nursing aides. Female nursing aides from a university hospital who had suffered episodes of back pain for at least six months were included in the study. Participants were randomly divided into a control group and an intervention group. There was a statistically significant decrease in the frequency of cervical pain in the last two months and in the last seven days in the intervention group. There was also a reduction in cervical pain intensity in the two periods (2 months, 7 days) and lumbar pain intensity in the last 7 days. The results suggest that a program of regular exercise with an emphasis on ergonomics can reduce musculoskeletal symptoms in nursing personnel

CHAPTER - III

METHODOLOGY

Research methodology is the way to systematically solve the research problem. Methodology occupies a key position as far as research documentation is concerned. It may be understood as a science of studying how research is done. Methodology is a system of models, procedures and technique used to find the results of research problem. It involves the procedure in which the researcher starts from the identification of the problem to the final conclusion.

This chapter deals with the research approach, design, setting of the study, population, sample size, sampling technique, sample selection criteria, description of the tool, validity, reliability, pilot study, data collection procedure, and data analysis.

Research methods are the technique used by the researcher to structure a study to gather and analyze information relevant to research question (Polit and Beck 2004).

The present study is carried out to determine the effectiveness of stretching exercise in reduction of low back pain among staff nurses working in a selected hospitals, Kanyakumari district

RESEARCH APPROACH

Research approach is defined as a general set of orderly discipline procedure used to acquire information (Polit and Hungler, 2004).

In this study quantitative research approach was used to accomplish the objectives of the study.

RESEARCH DESIGN

Research design is defined as "overall plan for addressing a research questions, including specification for enhancing the study integrity.

The research design selected for this study was quasi experimental pre test, post test control group design.

The diagrammatic representation of study design was

Group	Pretest	Intervention	Posttest
Experimental Group	E_1	X	E_2
Control Group	C_1		C_2

Key

E_1-Pretest assessment of low back pain among staff nurses in experimental group.

E_2-Posttest assessment of low back pain among staff nurses in experimental group.

X-Intervention (Stretching Exercise)

C_1- Pretest assessment of low back pain among staff nurses in experimental group.

C_2- Posttest assessment of low back pain among staff nurses in experimental group.

SETTING OF THE STUDY

"Settings are the most specific place when data collection occurs".

Setting is the general location and condition in which data collection takes place.

for the study.The study was conducted in PS Hospital Thalakulam, which is situated 15 kms away from the Global College of Nursing Nattalam. The researcher select 60 staff nurses who were willing to participate.

VARIABLES

Variables are often inherent characteristics or research subjects (Pilot 2008).

Independent variable – Stretching Exercise

Dependent variable – Level of low back pain among staff nurses.

Demographic variable – Age, sex, educational status,unit, marital status, clinical experience.

POPULATION

A population is the entire aggregation of cases in which a researcher is interested (Polit and Hungler, 2006).

Staff nurses who belongs to the age group of 21 to above 30years.

SAMPLE SIZE

Sample size is the total number of study participant in a study (polit,2008).

For this study the sample size was 60. Among them, 30 samples were in the experimental group and 30 samples were in the control group

SAMPLING TECHNIQUE

Sampling technique is the process of selecting a portion of the population to represent the entire population (polit, 2008).

The sampling technique adopted for this study was purposive sampling technique by using purposive sampling method.

CRITERIA FOR SAMPLE SELECTION

The sample selection was based on following inclusion and exclusion criteria.

Inclusion criteria

- Those who are willing to participate the study.
- Both male and female staffs.
- Cooperative.

Exclusion criteria

- Those who are not willing to participate.
- Staffs who are previously exposed to the Stretching Exercise.

DATA COLLECTION TOOL

A research tool is an instrument used to collect the data. A well prepared research tool enhances the researcher to proceed with the data collection effectively so that the findings will be accurate.

DESCRIPTION OF THE TOOL

The tool was developed after the extensive review of literature, internet search and experts advice. It was decided that the Virginia modified back pain functional scale could be an appropriate tool to assess the low back pain among stretching exercise.

FORMAT OF THE TOOL

The tool for data collection consist of two parts.

Section A – Demographic variables

This section deals with demographic variables including age, sex, educational status, unit, number of duty hours per day, marital status, clinical experience.

Section B –assessment scaleVirginia modified back pain functional scale

Virginia modified back pain functional scale consist of score from 0 to 60 for the subjective assessment of low back pain among staff nurses. The scoring is

Measures

Measures	Normal 0	Mild 1	Moderate 2	Severe 3	Very severe 4	Worst pain 5
(1) While doing usual ward activities						
(2) While doing recreational activities						
(3) performing heavy activities around your ward						
(4) While bending or stooping						
(5) While wearing your shoes or shocks						
(6) While lifting a patient						
(7) While lying on the bed						
(8) standing for one hour						
(9) walking in the ward						
(10) going up or down by stairs						
(11) sitting for one hour						
(12) travelling for one hour						

Measures	Points
Normal	**0-10**
Mild	**11-20**
Moderate	**21-30**
Severe	**31-40**
Very severe	**41-50**

Worst pain	**51-60**

Scoring

0-10 -Normal

11-20 -Mild

21-30 -Moderate

31-40 -Severe

41-50 -Very severe

51-60 -worst pain

Score interpretation

VALIDITY

Validity is the degree to which an instrument measure is intended to measure (Polit, 2008).

Data collection tool was given to 5experts for content validity. The experts were requested to check for the relevance, sequence and adequacy of the content in the tool. Modifications and necessary corrections were made.

RELIABILITY

Reliability is defined as," The degree of consistency or dependability with which an instrument measures an attribute (Denise and Polit 2011).

The reliability was assessed by using test retest method r = 0.9. The tool was used in this study.

PILOT STUDY

Pilot study is designed as small scale version are trail run done in preparation of major study.

A pilot study was conducted at S.U.T. Hospital Pattom, An administrative approval was obtained from the head persons to conduct the pilot study. Six staff nurses were selected a purposive sampling. The researcher introduced herself to the study subjects and establish good rapport.

Then the researcher gave short introduction about her study and stretching exercise. The pre test and post test level of low back pain was assessed by Virginia modified back pain functional scale. The sample were selected by using purposive sampling technique.

DATA COLLECTION PROCEDURE

After obtaining formal approval from the principal, head of the department andthe director of the PS Medical Trust Hospital Thalakkulam, the investigator was preceded with the data collection.

Virginia modified back pain functional scale was used as a tool for data collection. The investigator established rapport with the nurses study was conducted at PS Medical Trust Hospital Thalakkulam. The sample was selected by purposive sampling technique based on sample criteria. Written consent was obtained and confidentiality was assured.

The pre test was conducted. Researcher selected 30 samples from PS Medical Trust Hospital Thalakkulam through purposive sampling technique. Virginia modified Back Pain Functional scale was used to assess the level of back pain. The time taken

by the researcher to complete the tool for 30 samples was 1 hour. The samples were asked to choose the correct response from the given options. After the pre test the samples were taught about Stretching exercise with 3 steps warm up in good ventilated area for weekly 6 days. The duration of the procedure was 30 minutes. The samples were made to practice the exercise daily in front of the researcher. The post test was done on the 28th day of intervention. The investigator got permission for PS Medical Trust Hospital Thalakkulam.

The data was collected between 5-10-2015 to 31-10-2015. The investigator administered Virginia modified Back Pain Functional scale for both experimental and control group to assess the level of low back pain.

The main study was conducted at P.S Medical Trust Hospital, Thalakulam. Data collection was done for one month. Before conducting the study formal permission was obtained from the P.S Medical Trust Hospital, Thalakulam. Based on inclusion criteria 30 samples were collected for both experimental and control group. Before and after implementing the technique pre test and post test was conducted by using the Virginia modified back pain functional scale.

PLAN FOR DATA ANALYSIS

Both descriptive and inferential statistics were used to analyze the data.

Descriptive statistics

1) Frequency and percentage distribution was used to analyze the demographic variables.

2) Frequency and percentage distribution was used to evaluate the level of low back pain.

3) Mean and standard deviation was used to evaluate the effectiveness of stretching exercise in the level of low back pain among staff nurses.

Inferential statistics

1) Paired 't' test was used to compare the post test level of low back pain of experimental and control group.

2) Chi-square test was used to find out association of the pre test level of of low back pain of the experimental and control group.With the selected demographic variables.

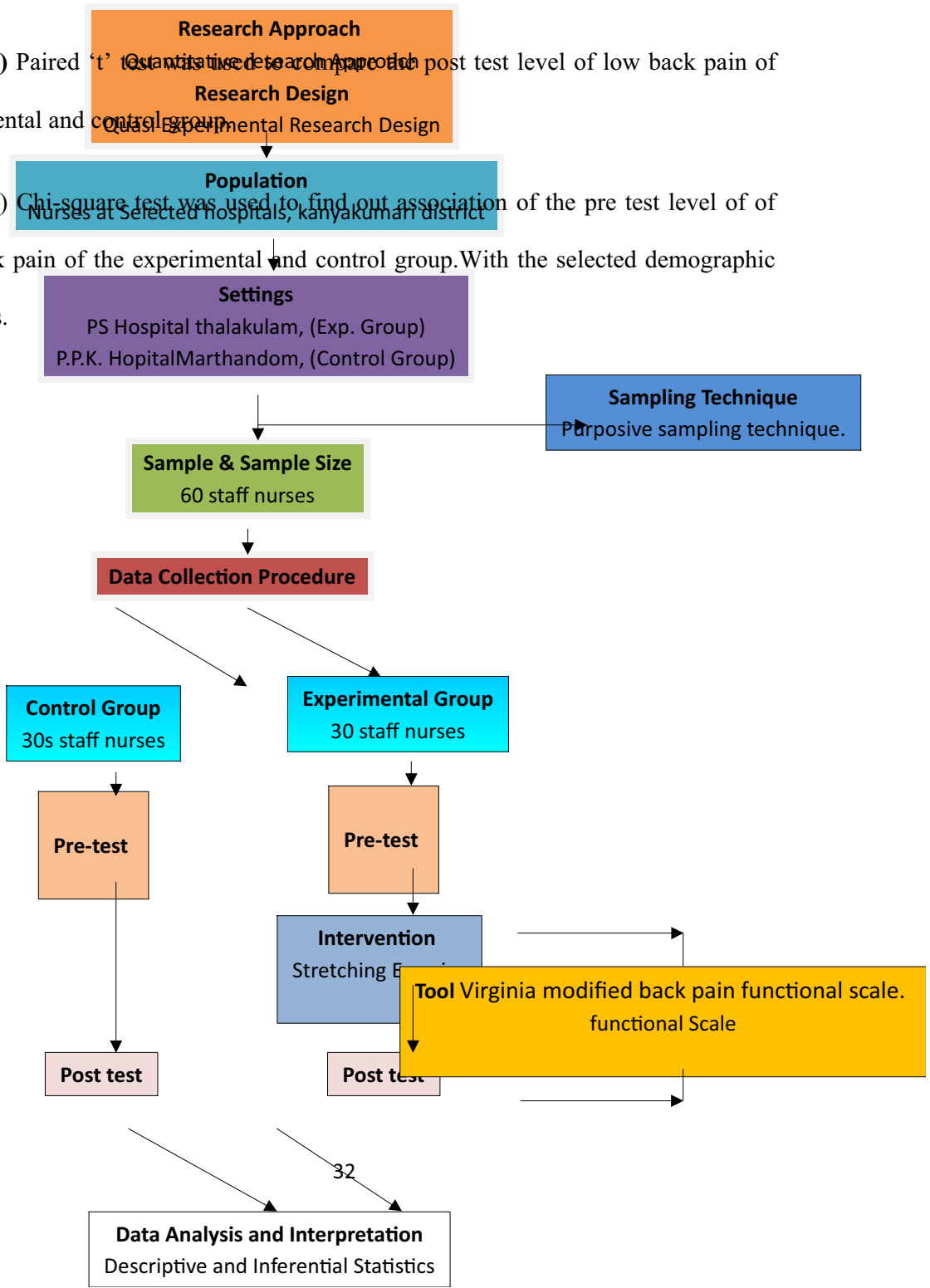


FIG.2 Schematic Representation of Research Methodology

.SUMMARY

This chapter dealt with research approach, research design, variables, population, description of the setting, sampling, description of the tool, pilot study, and method of data collection and plan for data analysis.

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

The purpose of analysis was to reduce the data collected in an intelligible and interpretable form, using different statistical methods such as descriptive and inferential statistical analysis.

According to Polit and Hungler, (2005) analysis is the method of organizing, sorting and scrutinizing data in such a way that research question can be answered.

In this study deals with the analysis and interpretation of the collected data from 60 staff nurses with back pain in order to assess the effectiveness of stretching exercise, by assess the pre test and post test scores among experimental group and control group.

The analysis and interpretation of data were based on data collection and the results were computed by using descriptive (mean, frequency, percentage distribution and standared deviation) and inferential ('t'-test and chi-square test) statistics and the results were interpreted in tables, figures and diagrams.

The study findings are presented in sections as follows:

Section: A

Frequency and percentage of sample according to the demographic variables in experimental group and control group.

Section: B

1) Assessment of the level of low back pain among staff nurses in both experimental group and control group before intervention.

2) Assessment of the level of low back pain among staff nurses in both experimental group and control group after intervention.

Section: C

1) Comparison of pre test level of low back pain among staff nurses in experimental and control group
2) Comparison of post test level of low back pain among staff nurses in experimental and control group

Section: D

Association between the pre test level of low back pain among staff nurses in experimental group and control group with selected demographic variables (Age, Sex, Educational status, unit, marital status, clinical experience).

SECTION-A

DESCRIPTION OF DEMOGRAPHIC VARIABLES OF STAFF NURSES WITH LOW BACK PAIN

Table 4.1 Frequency and percentage of sample according to the demographic variables in experimental group and control group.

n=60

Sl. No	Demographic Variables	Experimental Group		Control Group	
		f	%	f	%
1	Age in years				
	• 21-25 years	16	53.3	17	56.6
	• 26-30 years	8	26.6	7	23.3
	• Above 30 years	6	20	6	20
2	Sex				
	• Male	6	20	6	20
	• Female	24	80	24	80
3	Educational status				
	• GNM	3	10	3	10
	• Post B.Sc (N)	18	60	18	60
	• B.Sc (N)	6	20	6	20
	• M.Sc (N)	3	10	3	10

Sl. No	Demographic Variables	Experimental Group		Control Group	
		f	%	f	%
4	Unit				
	• ICU	10	33.3	12	40
	• General Ward	11	36.6	11	36.6
	• Surgical Ward	7	23.3	7	40
	• Casualty	2	6.66	0	0

5	Marital Status				
	• Married	14	46.6	14	46.6
	• Unmarried	16	53.3	6	20
6	Clinical Experience				
	• Since 6 months-1 year	4	13.3	3	10
	• Since 1-2 year	11	36.6	14	46.6
	• Since 2-3 years	11	36.6	11	36.6
	• Above 3 years	4	13.3	4	13.3

The above table 4.1 shows with regard to that Age in years in experimental group, 16(53.3%) were in the age group of 21-25 years, 8(26.6%) were in the age group of 26-30 years, 6(20%) were in the age group of above 30 years, where as in the control group, 17(56.6%) were in the age group of 21-25 years, 7(23.3%) were in the age group of 26-30 years, 6(20%) were in the age group of above 30 years.

With regard to the Sex in the experimental group, 6(20%) were males and 24(80%) were female where as in the control group, 6(20%) were males and 24(80%) were females.

Regarding the Educational status in experimental group 3(10%) were GNM, 18(60%) were Post B.sc (N), 6(20%) were B.Sc (N), 3(10%) were M.Sc (N). In control group 3(10%) were GNM, 18(60%) were Post B.sc (N), 6(20%) were B.Sc (N), 3(10%) were M.Sc (N).

Regarding the unit in experimental group 10(33.3%) were ICU, 11(36.6%) were General Ward, 7(23.3%) were Surgical Ward and 2(6.66%) were Casualty .In control group 12 (40%) were ICU, 11(36.6%) were General Ward, 7(40%) were Surgical Ward and 0(0%) were Casualty

Regarding the Marital status in experimental group 14(46.6%) were married, 16(53.3%) were unmarried,. In control group 14(46.6%) were married, 6(20%) were unmarried.

Regarding the Clinical experience in experimental group 4(13.3%) were Since 6 months to 1 year, 11(36.6%) were Since 1-2 years, 11(36.6%) were Since 2-3 years and 4(13.3%) were Above 3 years. In control group 3 (10%) were Since 6 months to 1 year, 14(46.6%) were Since 1-2 years, 11(36.6%) were Since 2-3 years and 4(13.3%) were above 3 years.

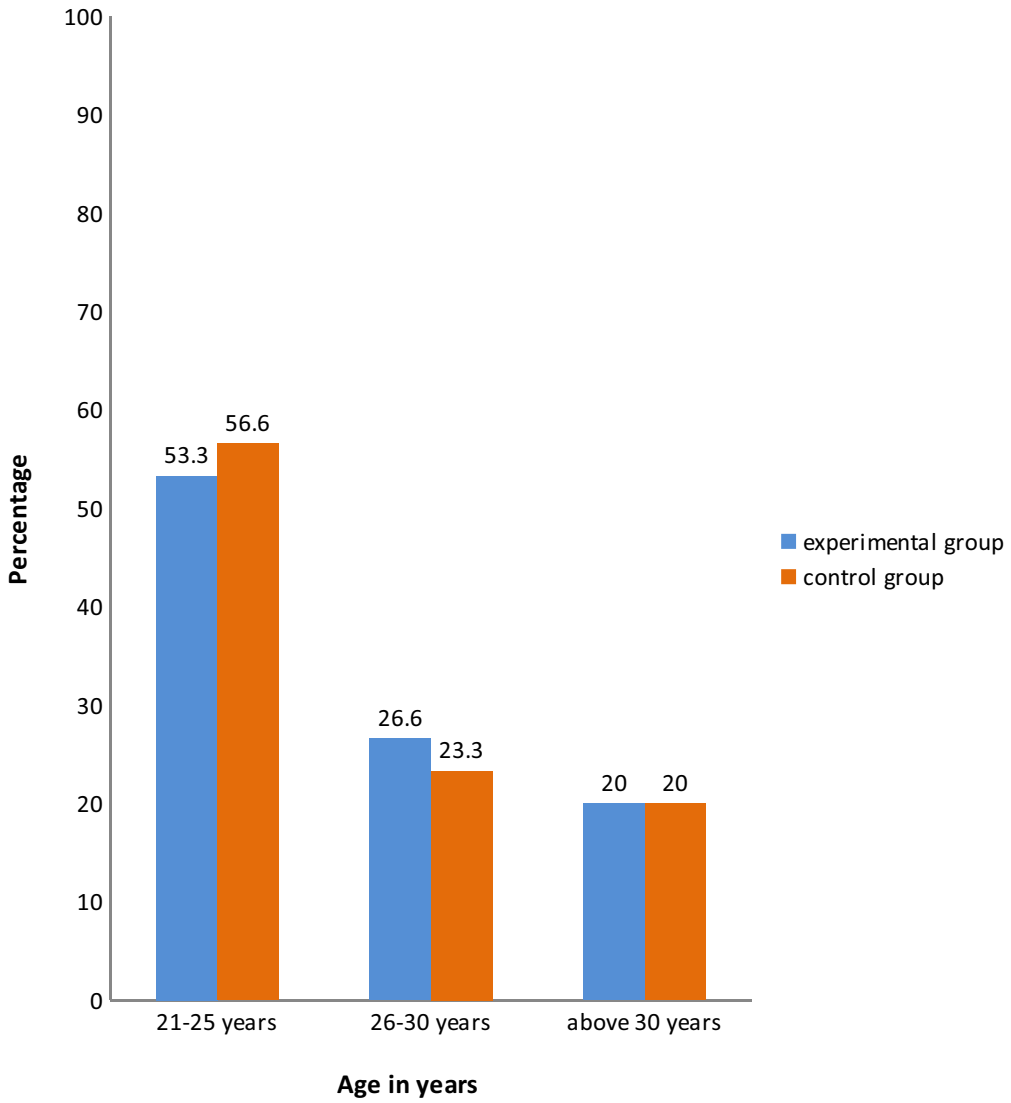


Fig 4.1 Distribution of samples according to age

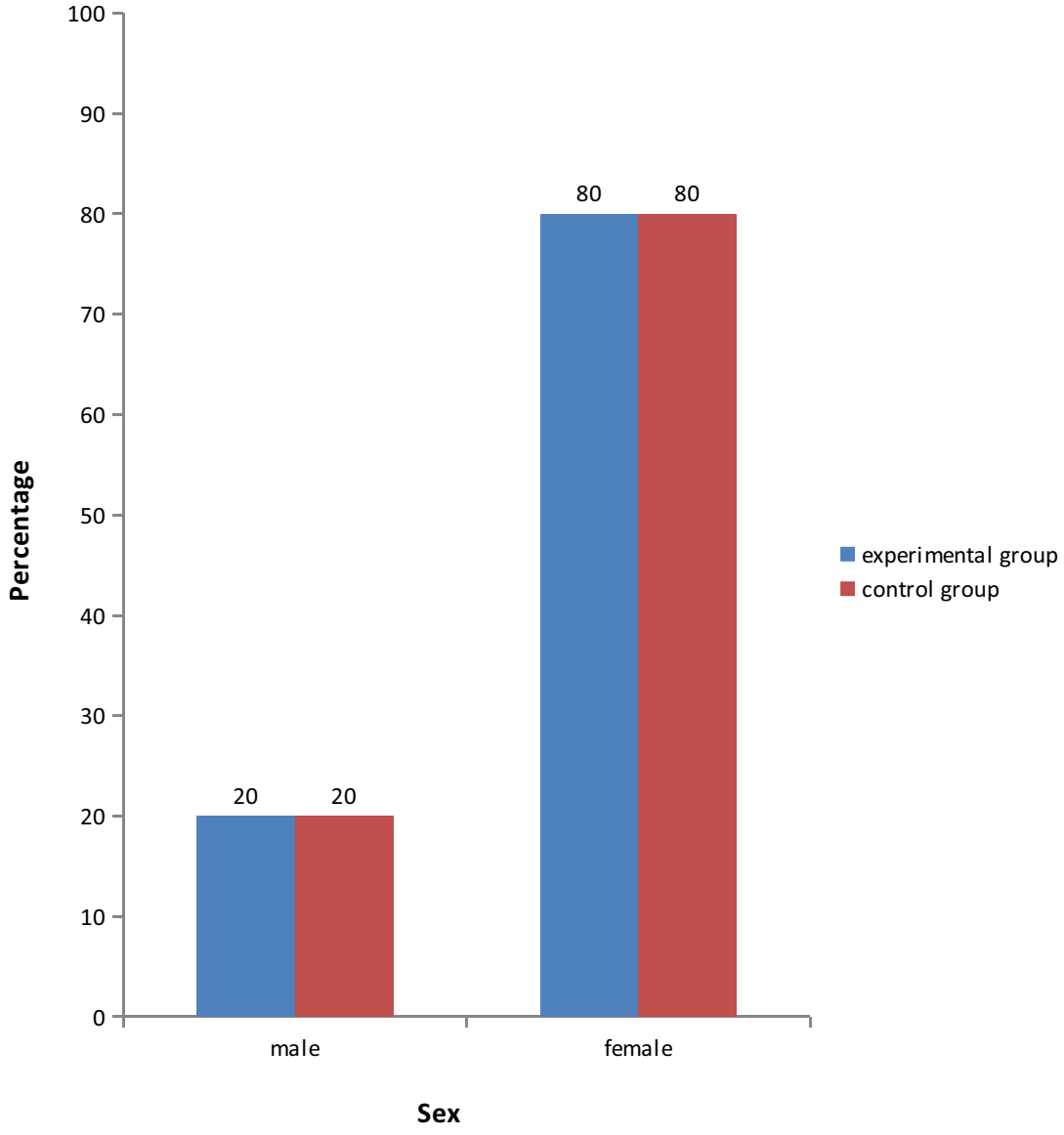


Fig 4.2 Distribution of samples according to sex

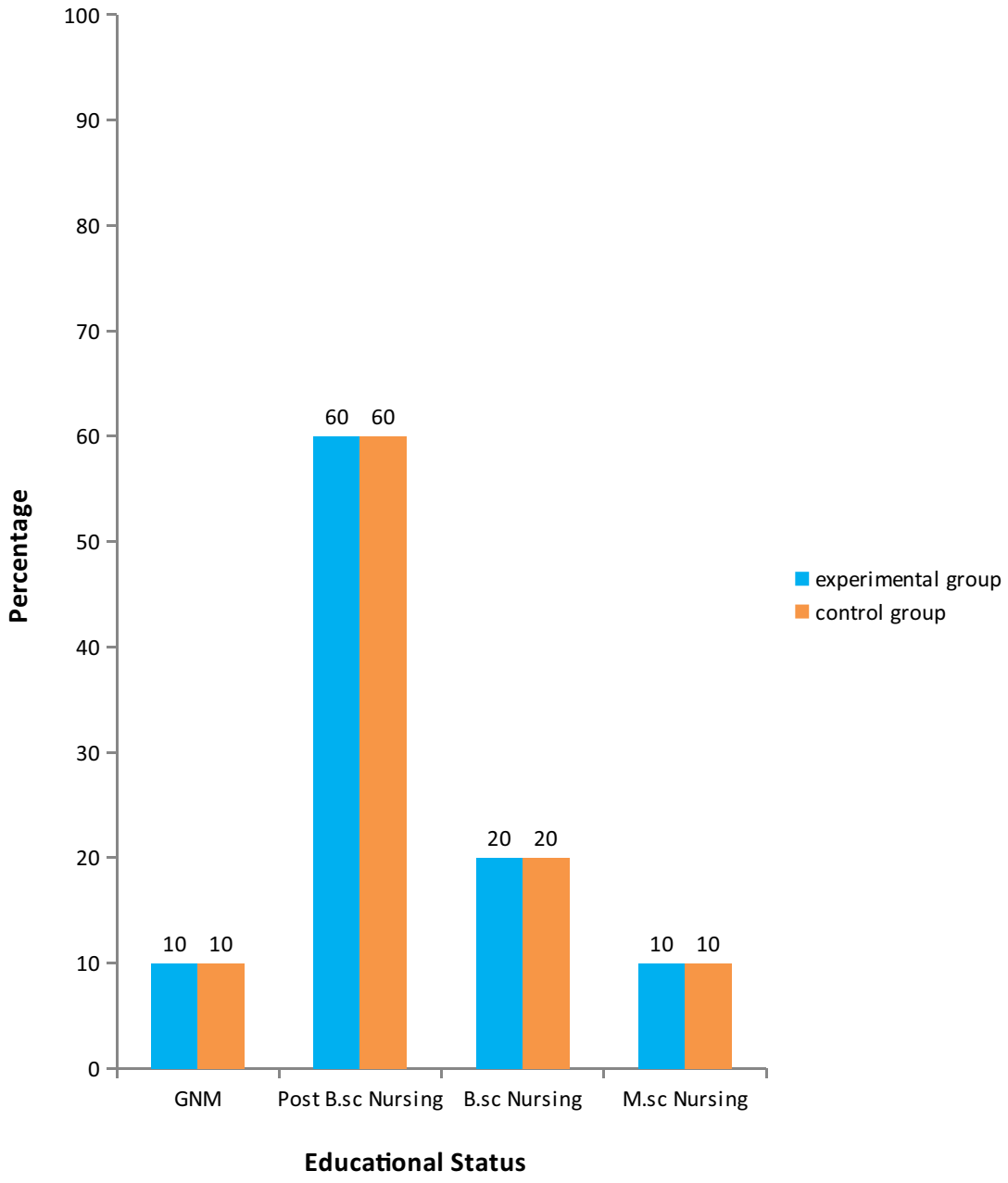


Fig 4.3 Distribution of samples according to educational status

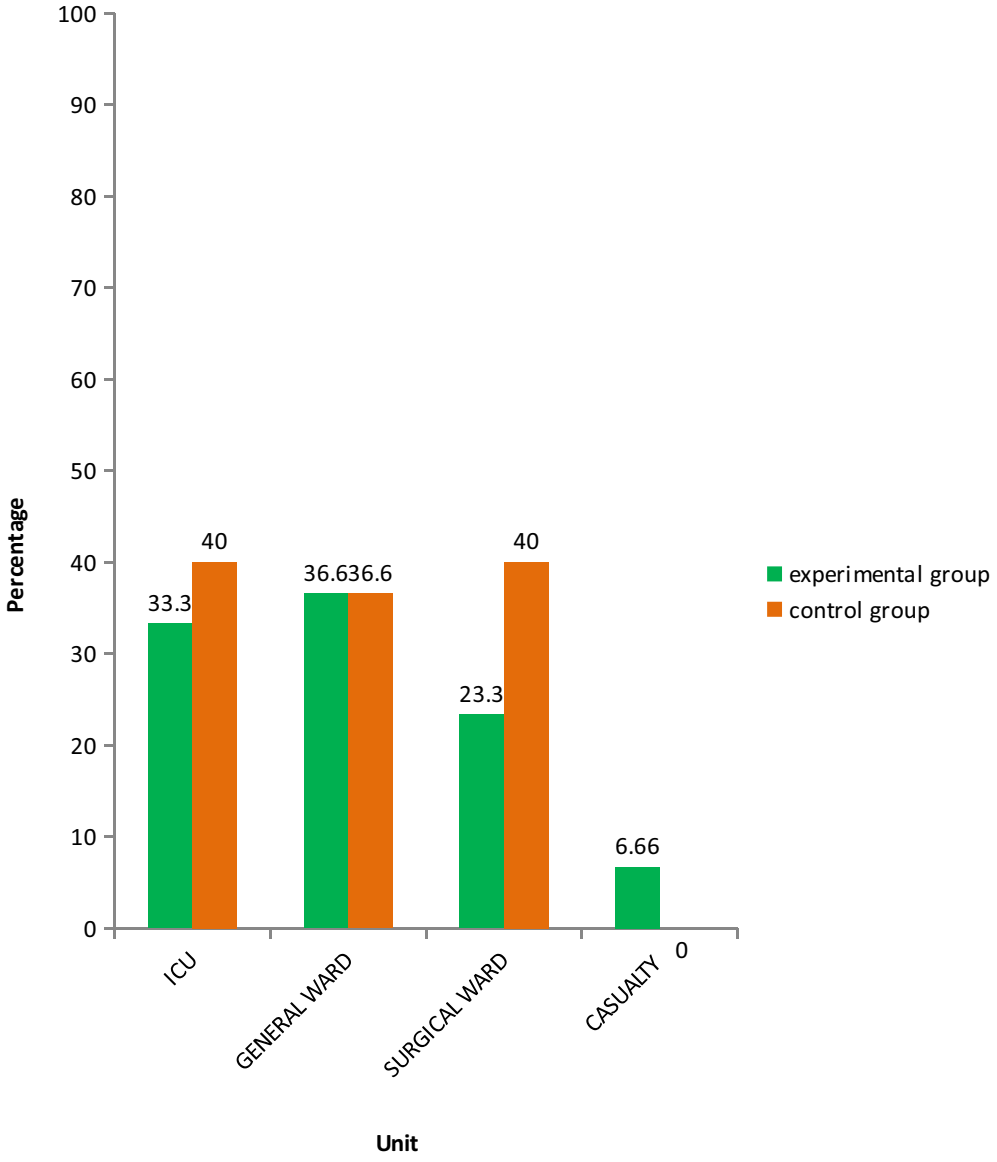


Fig 4.4 Distribution of samples according to unit

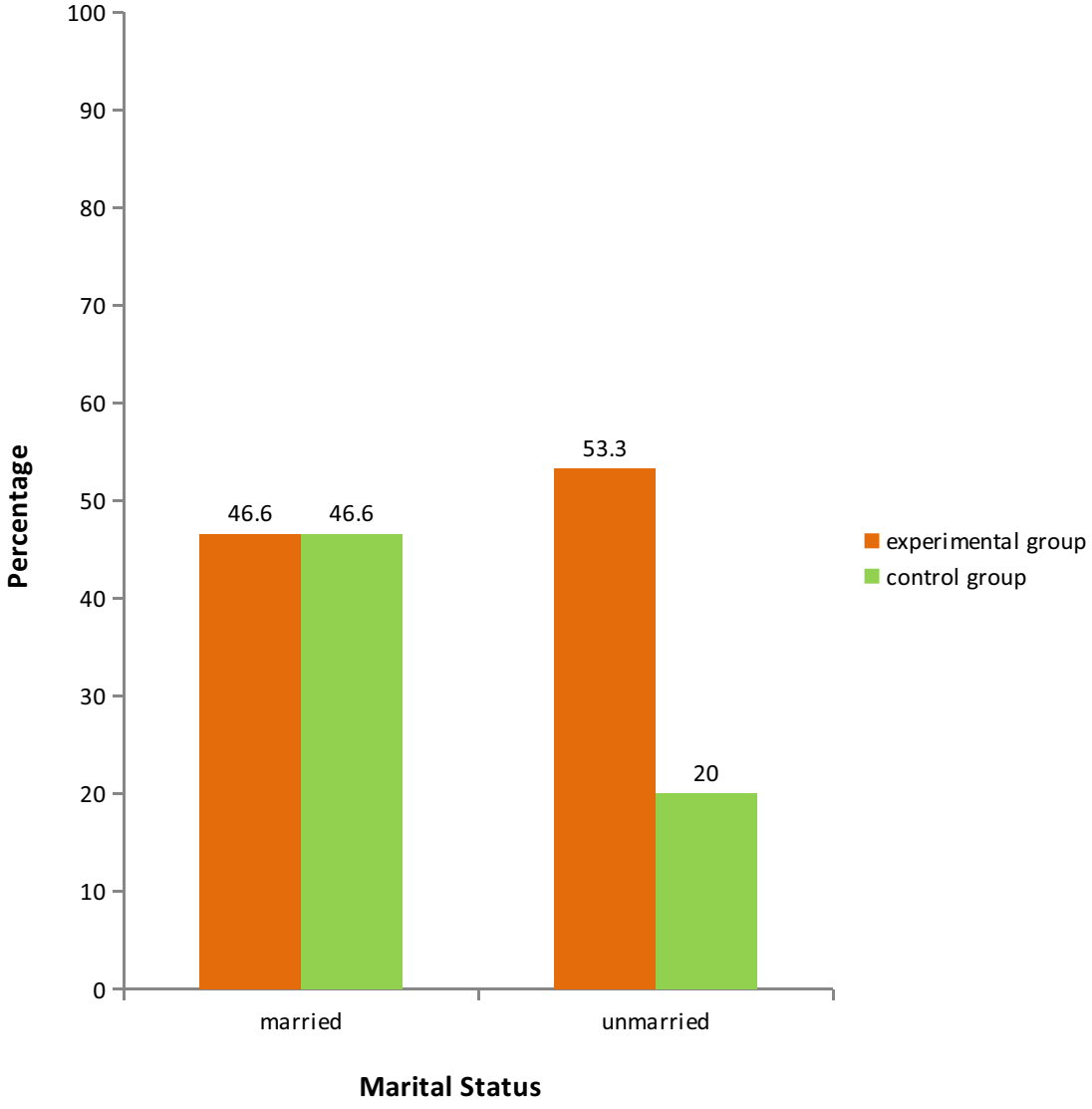


Fig 4.5 distribution of samples according to marital status

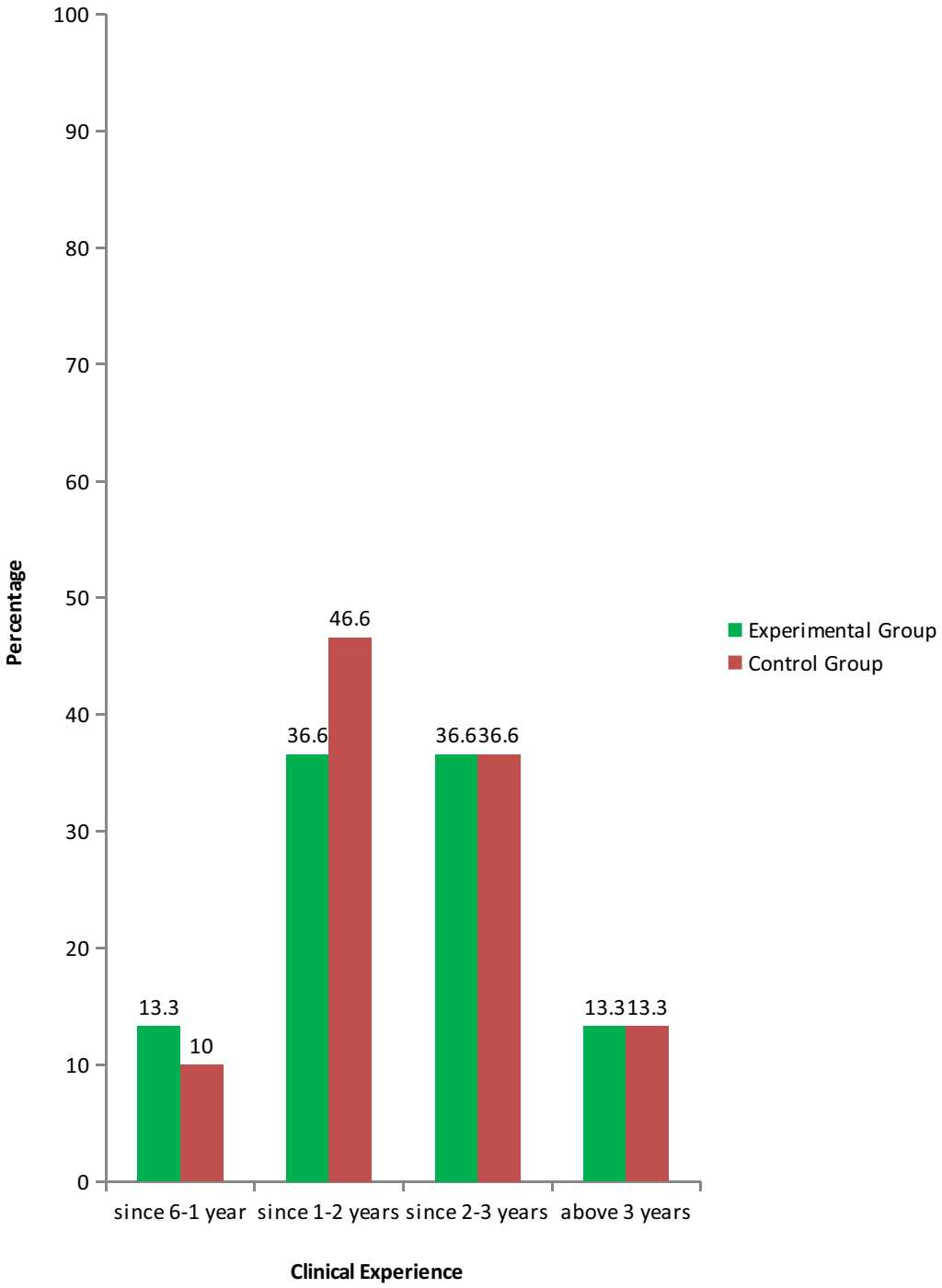


Fig 4.6 Distribution of samples according to clinical experience

SECTION -B

table 4.2 Assessment of the level of low back pain among staff nurses in both experimental group and control group before intervention

SL NO	Level of lowback pain	Pre-test			
		Experimental group		Control group	
		f	%	f	%
1	Normal	**0**	**0**	**0**	**0**
2	Mild	**5**	**16.6**	**2**	**6.66**
3	Moderate	**14**	**46.4**	**10**	**33.3**
4	Severe	**10**	**33.3**	**15**	**50**
5	Very Severe	**1**	**3.33**	**3**	**10**
6	Worst Pain	**0**	**0**	**0**	**0**

The above table 4.2.shows the pre test level of low back pain in the experimental group and control group among staff nurses with low back pain.

Out of 30 subjects in the experimental group, 0(0%) of them Normal level of low back pain, 5(16.6%) of them had Mild level of low back pain, 14(46.6%) had Moderate level of low back pain, 10(33.3%) had Severe level of low back pain, 1(3.33%) had Very Severe level of low back pain and 0(0%) had Worst pain level of low back painin their pre-test assessment. Out of 30 subject in the control group 0(0%) of them Normal level of low back pain, 2(6.66%) of them had Mild level of low back pain, 10(33.3%) had Moderate level of low back pain, 15(50%) had Severe level of low back pain, 3(10%) had Very Severe level of low back pain and 0(0%) had Worst pain level of low back pain in their pre-test assessment.

Fig 4.7 Assessment of the level of low back pain among staff nurses in both experimental group and control group before intervention

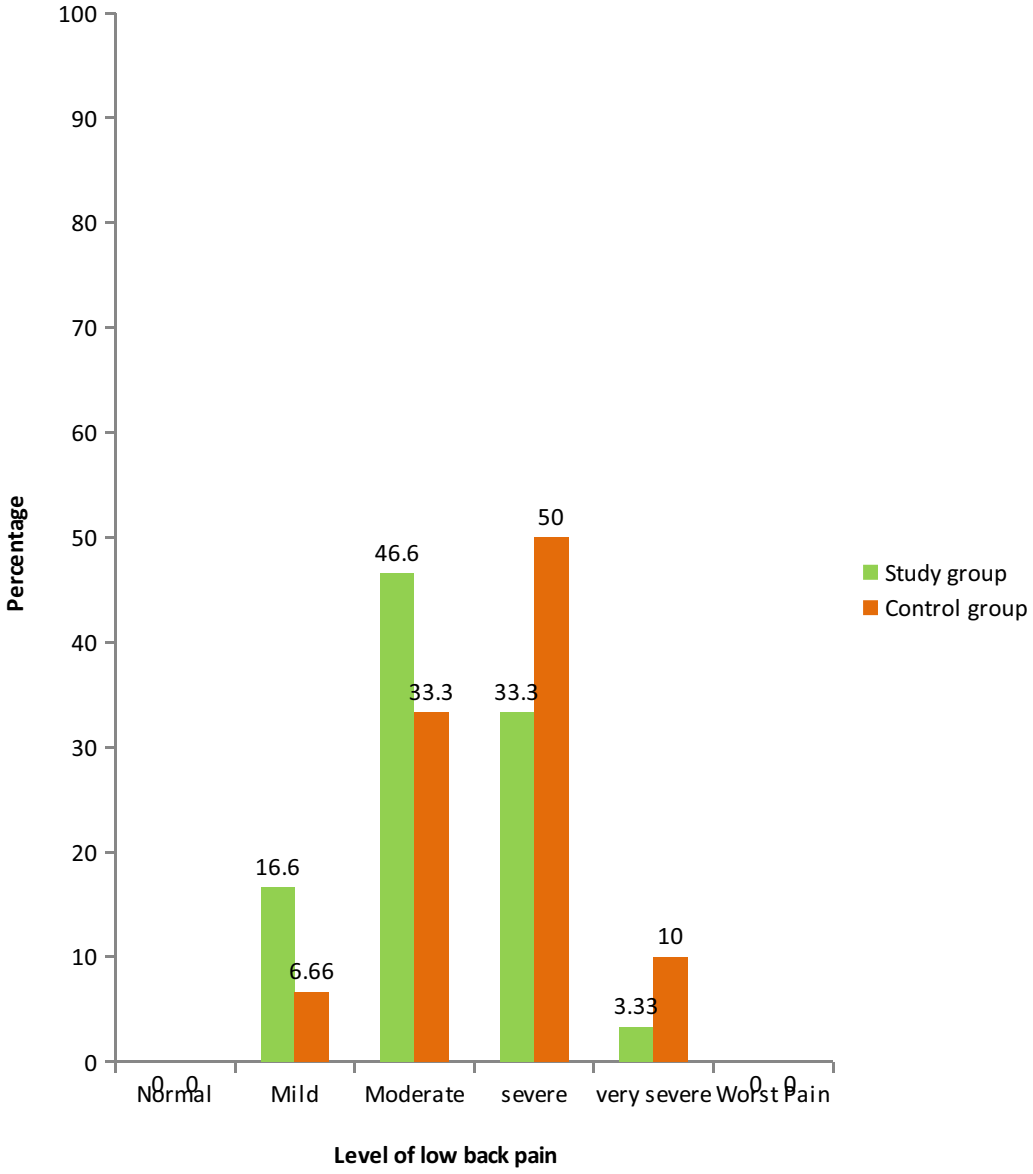


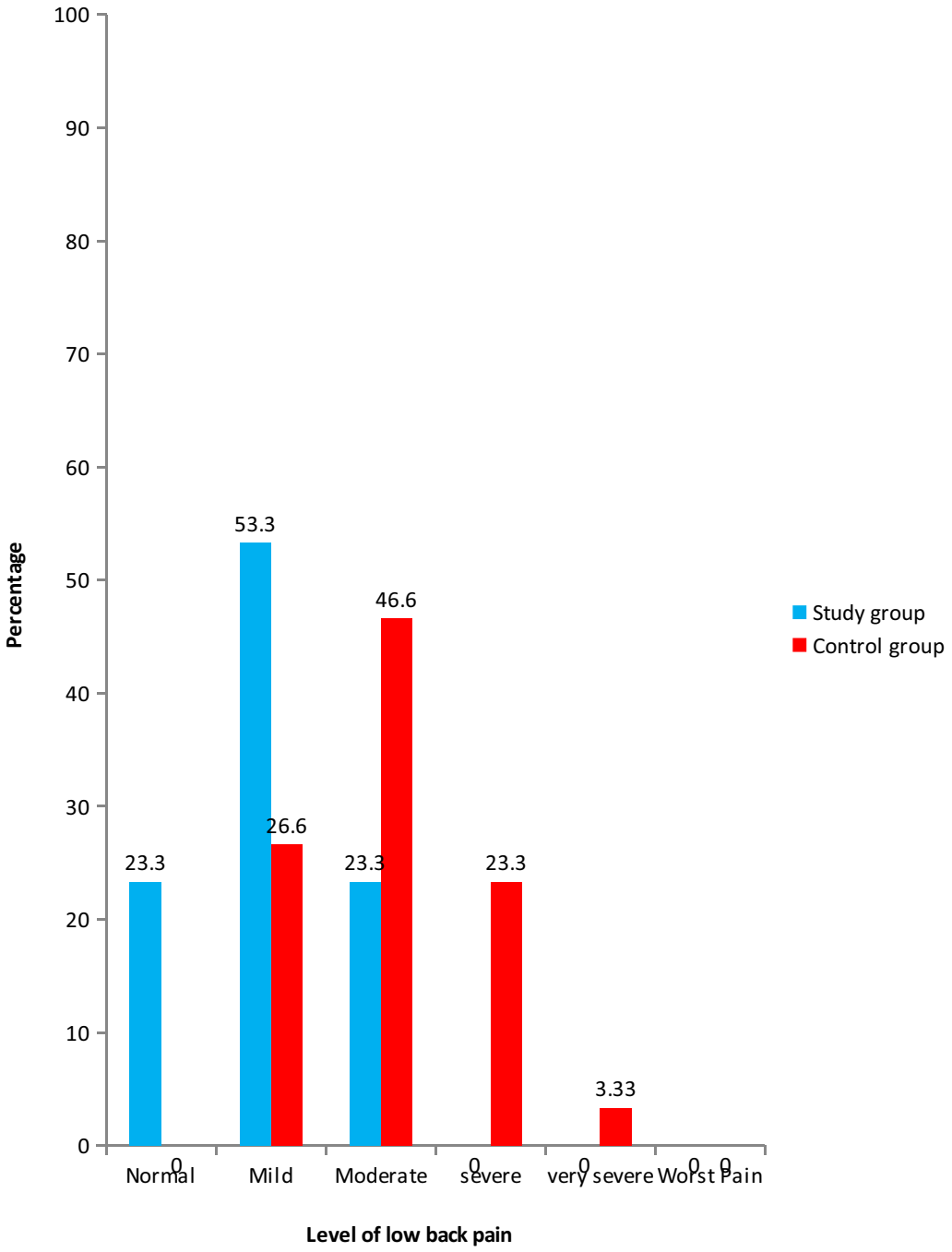
Table 4.3 Assessment of the level of low back pain among staff nurses in both experimental group and control group after intervention

SL NO	Level of low back pain	Post-test			
		Experimental group		Control group	
		f	%	f	%
1	Normal	**7**	**23.3**	**0**	**0**
2	Mild	**16**	**53.3**	**8**	**26.6**
3	Moderate	**7**	**23.3**	**14**	**46.6**
4	Severe	**0**	**0**	**7**	**23.3**
5	Very Severe	**0**	**0**	**1**	**3.33**
6	Worst Pain	**0**	**0**	**0**	**0**

The above table 4.3 shows the post test level of low back pain in the experimental and control group among staff nurses with low back pain

Out of 30 subjects in the experimental group, 7(23.3%) of them Normal level of low back pain, 016(53.3%) of them had Mild level of low back pain, 7(23.3%) had Moderate level of low back pain, 0(0%) had Severe level of low back pain, 0(0%) had Very Severe level of low back pain and 0(0%) had Worst Pain level of low back pain in their post-test assessment. Out of 30 subject in the control group 0(0%) of them Normal level of low back pain, 8(26.6%) of them had Mild level of low back pain, 14(46.6%) had Moderate level of low back pain, 7(23.3%) had Severe level of low back pain1 (3.33%) had Very Severe level of low back pain and 0(0%) had Worst Pain level of low back pain in their post-test assessment.

Fig.4.8.Assessment of the level of low back pain among staff nurses in both experimental group and control group after intervention.



SECTION: C

Table.4.4Comparison of pre test level of low back pain among staff nurses in experimental and control group.

Sl no	Group	Mean	SD	MD	't' value
1	**Experimental**				
	Group	27.3	7.29	10.7	17.63
	Pre test	16.6	5.37		
	Post test				
2	**Control Group**				
	Pre test	32.4	7.68	6.9	7.53
	Post test	25.5	7.72		

*-significant at p< 0.05 level

Table 4.4 reveals that among experimental group the mean pre test score was 27.3 with standard deviation with 7.29. The mean post test was 16.6 with standard deviation 5.37. The mean difference was 10.7. The obtained 't' value was 17.63,whereas the table value was 1.69. It was significant at p< 0.05 level.

It also reveals that among control group the mean pre test score was 32.4 with standard deviation with 7.68. The mean post test was 25.5 with standard deviation 7. 72. The mean difference was 6.9. The obtained 't' value was 7.53, where as the table value was 1.69. It was significant at p< 0.05 level.

It was inferred that stretching exercise was highly effective in reducing of low back pain among staff nurses with low back pain.

Table4.5 Comparison of post test level of low back pain among staff nurses in experimental and control group.

Sl no	Group	Mean	SD	MD	't' value
1	Experimental group (post test)	16.6	5.37		
				-8.9	2.64*
2	Control group (post test)	25.5	7.72		

significant at p< 0.05 level

Table 4.5 reveals that among experimental group the mean post test score was 16.6 with standard deviation with 5.37. In the control group the mean post test was 25.5, with standard deviation 7.72. The mean difference was 8.9. The obtained't' value was 2.64, and the table value was1.69, which was significant at p< 0.05 level.

It was inferred that stretching exercise is effective in reducing low back pain among staff nurses with low back pain

SECTION: D

Table 4. 6 Association between the pre test level of low back pain among staff nurses in experimental group and control group with selected demographic variables (Age, Sex, Educational status, unit, marital status, clinical experience).

S. No	Demographic Variables	Experimental Group n=30					Control Group n=30				
		F	%	Df	T	X^2	F	%	Df	T	X^2
1	Age in years										
	• 21-25 years	16	53.5				17	56.6			
	• 26-30 years	8	26.6	2	5.99	8.53	7	23.3	2	5.99	23.7
	• Above 30 years	6	20				6	20			3
2	Sex										
	• Male	6	20	1	3.81	3.58	6	20	1	3.81	6.77
	• Female	24	80				24	80			
3	Educational status										
	• GNM	3	10				3	10			
	• Post B.Sc (N)	18	60	3	7.82	7.02	18	60	3	7.82	10.3
	• B.Sc (N)	6	20				6	20			2
	• M.Sc (N)	3	10				3	10			
4	Unit										
	• ICU	10	33.3				12	40			
	• General Ward	11	36.6				11	36.6			
	• Surgical Ward	7	23.3	3	7.82	75.9	7	40	3	7.82	7.71
	• Casualty	2	6.66			1	0	0			
5	Marital Status										
	• Married	14	46.6	1	3.81	3.18	4	46.6	1	3.81	3.17
	• Unmarried	16	53.3				6	20			

S. No	Demographic Variables	Experimental Group					Control Group				
		F	%	Df	T	X^2	F	%	Df	T	X^2
6	Clinical Experience										
	• Since 6 months-1 year	4	13.3				3	10			
	• Since 1-2 years	11	36.6	3	7.82	5.46	14	46.6	3	7.82	20.8
	• Since 2-3 years	11	36.6				11	36.6			4
	• Above 3 years	4	13.3				4	13.3			

Table 4.6 reveals that, there is significant association ($p<0.05$) between the low back pain and demographic variables like age in years, unit and the control group of demographic variables like age in years, sex, educational status, clinical experience of staff nurses in experimental and control group. Hence the research hypothesis H_3 accepted.

Summary

This chapter dealt with data analysis and interpretation in the form of statistical value based on objectives, 't' test was used to evaluate the effectiveness of stretching exercise on reducing low back pain. The chi-square test was used to find out the association between the low back pain with their demographic variables in experimental and control group.

CHAPTER V

DISCUSSION

The main aim of the study was to assess the effectiveness of stretching exercise in reduction of low back pain among staff nurses. The study was conducted by using quasi experimental pre and post test control group design. The present study was conducted in P.S Medical Trust Hospital at Kanyakumari District. The sampling technique is simple random sampling technique by using purposive sampling method.head and tail was used for this study. The total sample size was 60, among them 30 were in the experimental group and 30 were in the control group.Virginia modified back pain functional scale was used for data collection. After data collection, data was organized, tabulated, summarized and analyzed. The study findings were discussed in this chapter with reference to the objectives of the study.

OBJECTIVES

1) To assess the pre test and post test level of low back pain among staff nurses in experimental group and control group.

2) To find out the effectiveness of stretching exercise on low back pain among staff nurses in experimental and control group.

3) To associate the pre test level of low back pain among staff nurses in experimental and control group with their selected demographic variables. (Age, Sex, Educational status, unit, marital status, clinical experience)

The first objective of this study was to assess the pre test and post test level of low back pain among staff nurses in experimental group and control group.

Out of 30 subjects in the experimental group, 0(0%) of them Normal level of low back pain, 5(16.6%) of them had Mild level of low back pain, 14(46.6%) had Moderate level of low back pain, 10(33.3%) had Severe level of low back pain,1(3.33%) had Very Severelevel of low back pain and 0(0%) had Worst pain level of low back painin their pre-test assessment. Whereas in the post-test 7(23.3%) of them Normal level of low back pain. 16(53.3%) of them had Mild level of low back pain, 7(23.3%) had Moderate level of low back pain, 0(0%) had Severe level of low back pain,0(0%) had Very Severe level of low back pain and 0(0%) had Worst Pain level of low back pain in their post-test assessment.

Out of 30 subject in the control group 0(0%) of them Normal level of low back pain, 2(6.66%) of them had Mild level of low back pain, 10(33.3%) had Moderate level of low back pain, 15(50%) had Severe level of low back pain,3(10%) had Very Severe level of low back pain and 0(0%) had Worst pain level of low back pain in their pre-test assessment. Whereas in the post-test 0(0%) of them Normal level of low back pain, 8(26.6%) of them had Mild level of low back pain, 14(46.6%) had Moderate level of low back pain, 7(23.3%) had Severelevel of low back pain1(3.33%) had Very Severelevel of low back painand 0(0%) had Worst Pain level of low back pain in their post-test assessment.

Neusa Maria C Alexandre , Marco Antonio A de Moraes, et.al (2001)evaluate the effectiveness of a program designed to reduce back pain in nursing aides. Female nursing aides from a university hospital who had suffered episodes of back pain for at least six months were included in the study. Participants were randomly divided into a control group and an intervention group. The intervention

program involved a set of exercises and an educational component stressing the ergonomic aspect, administered twice a week. There was a statistically significant decrease in the frequency of cervical pain in the last two months and in the last seven days in the intervention group. The results suggest that a program of regular exercise with an emphasis on ergonomics can reduce musculoskeletal symptoms in nursing personnel.

It reveals that among experimental group the mean pre test score was 27.3 with standard deviation with 7.29. The mean post test was 16.6 with standard deviation5.37. The mean difference was 10.7. The obtained 't' value was 17.63,where as the table value was 1.69. It was significant at $p< 0.05$ level

It reveals that among control group the mean pre-test score was 32.4 with standard deviation with 7.68. The mean post-test was 25.5 with standard deviation 7. 72. The mean difference was 6.9. The obtained 't' value was 7.53, where as the table value was 1.69. It was significant at $p< 0.05$ level.

The second objective of this study was to find out the effectiveness of stretching exercise on low back pain among staff nurses in experimental and control group.

It reveals that among experimental group the mean post test score was 16.6 with standard deviation with 5.37. In the control group the mean post test was 25.5, with standard deviation 7.72. The mean difference was 8.9. The obtained't' value was 2.64, and the table value was1.69, which was significant at $p< 0.05$ level.

It was inferred that stretching exercise is effective in reducing low back pain among staff nurses with low back pain.

MatiPaasukeet.al(2015) conducted a study to investigate the effects of a home-exercise therapy programme on cervical and lumbar range of motion among intensive care unit nurses A quasi-experimental study was conducted among intensive

care unit nurses at Tartu University Hospital (Estonia) between May and July 2011. Thirteen nurses who had suffered musculoskeletal pain episodes in the lower back during the previous six months underwent an 8 week home-exercise therapy programme. Eleven nurses without musculoskeletal pain formed a control group. A Student's *t*-test was used to analyze any differences between the experimental and control groups. Cervical range of motion in flexion was significantly higher ($p < 0.01$) in the experimental group compared to the control group after therapy. Our results suggest an 8-week intensive home-exercise therapy programme may improve cervical and lumbar range of motion among intensive care nurses.

The third objective to associate the pre test level of low back pain among staff nurses in experimental and control group with their selected demographic variables.(Age, Sex, Educational status, unit, marital status, clinical experience)

It reveals that Age in years in experimental group ,16(53.3%) were in the age group of 21-25 years, 8(26.6%) were in the age group of 26-30 years, 6(20%) were in the age group of above 30 years, where as in the control group ,17(56.6%) were in the age group of 21-25 years, 7(23.3%) were in the age group of 26-30 years, 6(20%) were in the age group of above 30years.

With regard to the Sex in the experimental group, 6(20%) were males and 24(80%) were female where as in the control group, 6(20%) were males and 24(80%) were females.

Regarding the Educational status in experimental group 3(10%) were GNM, 18(60%) were Post B.sc (N) ,6(20%) were B.Sc (N),3(10%) were M.Sc (N) .In control group 3(10%) were GNM, 18(60%) were Post B.sc (N), 6(20%) were B.Sc (N), 3(10%) were M.Sc (N) .

Regarding the unit in experimental group 10(33.3%) were ICU, 11(36.6%) were General Ward, 7(23.3%) were Surgical Ward and 2(6.66%) were Casualty .In control group 12 (40%) were ICU, 11 (36.6%) were General Ward, 7(40%) were Surgical Ward and 0(0%) were Casualty

Regarding the Marital status in experimental group 14(46.6%) were married, 16(53.3%) were unmarried,. In control group 14(46.6%) were married, 6(20%) were unmarried.

Regarding the Clinical experience in experimental group 4(13.3%) were Since 6 months to 1 year, 11(36.6%) were Since 1-2 years, 11(36.6%) were Since 2-3 years and 4(13.3%) were Above 3 years. In control group 3 (10%) were Since 6 months to 1 year, 14(46.6%) were Since 1-2 years, 11(36.6%) were Since 2-3 years and 4(13.3%) were above 3 years.

Ruey-Hsia Wang, et al (2015) conducted a study that examined the effects of stretching exercise intervention on nurse low back pain. Using a pretest and posttest two-group design, a total of 60 female staff nurses employed by a medical center in Taiwan were selected by convenience sampling. Participants in the experimental group ($N = 30$) practiced stretching exercises while experiencing low back pain. The participants in the control group ($N = 30$) managed their back pain as usual. Decrease in low back pain intensity of the experimental group was significantly larger than that of the control group. Stretching exercises is an effective method for treating low back pain.

There is significant association ($p< 0.05$) between the level of low back pain and demographic variables.It reveals that, there is significant association ($p<0.05$) between the low back pain and demographic variables of staff nurses in experimental and control group. Hence the research hypothesis H_3 is accepted.

Summary

This chapter dealt with the discussion of the study with reference to the objectives and related studies.

CHAPTER VI

SUMMARY, CONCLUSION, LIMITATIONS, NURSING IMPLICATION AND RECOMMENDATIONS

This chapter deals with summary, conclusion, limitation and recommendation of the study. Further it includes implications for the Nursing Practice, Nursing Education, Nursing Administration and Nursing Research.

Summary of the Study

The aim of the study to evaluate the effectiveness of stretching exercise in reduction of low back pain among staff nurses working in a selected hospitals, Kanyakumari district.

The objectives of the study were

1) To assess the pre test and post test level of low back pain among staff nurses in experimental group and control group.

2) To find out the effectiveness of stretching exercise on low back pain among staff nurses in experimental and control group.

3) To associate the pre test level of low back pain among staff nurses in experimental and control group with their selected demographic variables.(Age, Sex, Educational status, unit, marital status, clinical experience)

A quasi experimental pre post test control group design was chosen for this study. Purposive sampling technique was used for this study. Subjects were selected based upon the inclusion and exclusion criteria. 60 subjects were selected for the study. 30 Subjects were assigned to the experimental group and 30 subjects were assigned to the control group.

The tool used to collect the data consisted of two parts, Part I: consisted of demographic Variables with Age, Sex, Educational status, Unit, Number of duty hours per day, Clinical experience, Part II consisted of Virginia modified back pain functional scale to assess the level of low back pain among staff nurses.

Reliability of the tool was calculated by using test-retest method(r =0.9). Data collection was done for 4 weeks. Sample were selected based on the inclusion and exclusion criteria. Pre test was done by using demographic variables and Virginia modified back pain functional scale on day one.

After the stretching exercise intervention post test was done. Collected data was analyzed by both descriptive statistics (mean, standard deviation, frequency and percentage) and inferential statistics (dependent and independent‘t’ test, chi-square) and results were calculated.

Major Findings of the Study

It reveals that among experimental group the mean pre-test score was 27.3 with standard deviation with 7.29. The mean post-test was 16.6 with standard deviation5.37. The mean difference was 10.7. The obtained ‘t’ value was 17.63,where as the table value was 1.69. It was significant at $p< 0.05$ level.

It was inferred that stretching exercise was highly effective in reducing of low back pain among staff nurses with low back pain.

It reveals that among control group the mean pre-test score was 32.4 with standard deviation with 7.68. The mean post-test was 25.5 with standard deviation 7. 72. The mean difference was 6.9. The obtained‘t’ value was 7.53, where as the table value was 1.69. It was significant at $p< 0.05$ level.

With regard to the association between the level of low back pain and selected demographic variables in experimental group and control group

Conclusion

The main conclusion of the present study is stretching exercise is effective in reducing low back pain among staff nurses which is denoted by significant level of low back pain After the intervention there had been a significant reduction in level of low back pain. The selected subjects became familiar and found themselves comfortable and also expressed satisfaction.

Implication of the Study

Nursing implication includes specific information for Nursing practice, Nursing Education, Nursing Administration and Nursing research.

Nursing practice

- Stretching exercise can be incorporated into routine nursing intervention.
- Stretching exercise can be given for staff nurses working in multi specialty units. This therapy will help to reduce their low back pain.

Nursing education

- It is important to have educational programme on stretching exercise for all staff nurses, so that they can apply this technique to reduce the low back pain experienced by the staffs in the hospital.
- Nurse educator can encourage staffs to conduct health teaching sessions on various relaxation methods.
- Staff development programme need to be arranged, so that the nurse educators can encourage the students to provide relaxation therapies to the staff nurses.

Nursing research

- Researchers should focus on non-pharmacological interventions to reduce low back pain.
- The findings should be disseminated through conferences, seminars and publications in professional, national and international journals.

Recommendations

Recommendations include;

- A similar study could be conducted with low back pain for staff nurses to find out the effectiveness of the stretching exercise.
- A comparative study can be conducted to find out the difference in level of back pain, for both nurses
- A study can be conducted with large sample size to generalize the results of the study.
- A similar technique can be conducted using experimental and control group.
- Research can be conducted to find out the various innovative methods to reduce the level of low back pain
- Research can be done on various populations at various settings.
- Research can be done to compare the level of low back pain in staff nurses.

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APPENDIX I

P.S. MEDICAL TRUST
Puthuvilai, Thalakulam (P.O.)
Kanyakumari District, Tamil Nadu
S. India, Pin - 629 802.

Chairman & Managing Trustee
Dr. P. ARUMUGAM, M.D.,D.M.
P.S. MEDICAL CENTRE CAMPUS

Phone : 04651-222299, 222522, 22
Fax : 04651-222299, 221410
E-mail : psmt_hospital@yahoo.in

From

Director,
P.S.Medical Trust Hospital
Thalakulam,
Kanyakumari District

To

The Principal
Global College of Nursing,
Edavilagam, Nattalam,
Kanyakumari District.

Sir/Madam,

Sub: Permission for conducting research Reg-

As per your request, Miss.R.Anisha II year M.Sc(Nsg) from your College had conducted and demonstrated the topic " The effectiveness of stretching , exercise in reduction of low back pain among Staff Nurse" session she has conducted the classe for 20 session during October 2015. Many of our Staff Nurses are benefited by thi programme.

Medical Trust Hospital K.K. District Pin 629 802 Thalakulam

Dr.P.Arumugam, MD.,DM.,
DR. P. ARUMUGAM, MD., DM.,
Physician Neurologist
P.S. MEDICAL TRUST HOSPITAL
THALAKULAM, K.K. Dist. - 629802
SOUTH INDIA

Thalakulam,

02.11.2015.

34 Years of Excellence

PPK

PPK HOSPITAL

Main Road. Marthandam - 629 165
Ph:04651-270135, 273245, 273255
E-mail : ppkvijayakumar@gmail.com

24/09/2015

Ref.No.PPK/L34/2015

To

The Principal,
Global College of Nursing,
Edaivilagam
Nattalam- 629 165
K.K.Dist.

Sir,

Sub: Permission for M. Sc., Nursing Project – Regarding.

We are glad to inform that we approved permission to your college Student **MS. R. Anisha II yr M.Sc (N)**, to undergo project on **"A Study to Evaluate the effectiveness of Streteching Exercise in r eduction of Low Back Pain among Staff Nurses in a Selected Hospitals, K.K District.** in our Hospital from 24-09-2015 to 25-10-2015. We trust that your student will abide our hospital rules and regulations.

Thanking You,

P.P.K. HOSPITAL PIN : 629 165 MARTHANDAM

Administrative Officer

A. MATHIVANAN MBA
ADMINISTRATIVE OFFICER
PPK HOSPITAL
MARTHANDAM - 629 165

PARADISE YOGA AND NATUROPATHY HOSPITAL

Nanthavanam, Poonthoppu, Kannanoor P.O., K.K.Dist., TamilNadu., Pin : 629 158
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E-mail : drsugin@yahoo.co.in, info@drsuginparadise.com; Website : www.drsuginparadise.com

Ref.No : 68/CER/2015 Date : 4-6-20

CERTIFICATE

This is to certify that Miss. R. ANISHA, 2nd year M.sc, Nursing student of Global College of Nursing , Nattalam, Kanyakumari Dist, had under gone one month training program on Yoga and Stretching Excercises, under my guidance. She is fit to treat back pain patients with stretching Excercises.

4/6/15

Dr. R.S. SUGIN HERBERT, BNYS., Ph.D., (Psy)
Reg. No.: 0354

PARADISE YOGA AND NATUROPATHY HOSPITAL
Nanthavanam, Poonthoppu, Kannanoor P.O.,
Kanyakumari Dt. - 629 158

APPENDIX-III

LETTER SEEKING EXPERTS OPINION FOR VALIDITY OF TOOL

From

R.Anisha,

M.Sc (N) II year,

Global College of Nursing,

Nattalam.

To

Respected Sir/Madam,

I am doing II year M.Sc (N) in Global College of Nursing Nattalam as a partial fulfillment of the course, I have chosen a topic of my interest **"A study to evaluate the effectiveness of stretching exercise in reduction of low back pain among staff nurses working in a selected hospitals, kanyakumari district".** I haveprepared demographic data and standardized tool. I hereby kindly request you to evaluate the tool based on the evaluation criteria. Your opinion and suggestion will help me to the successful completion of my study.

Thanking you,

Yours truly,

APPENDIX-IV

EVALUATION CRITERIA CHECK LIST FOR VALIDATION

INTRODUCTION

The expert is requested to go through the following criteria for evaluation.

Three columns are given for responses and a column for remarks. Kindly place tick mark in the appropriate column and give remarks.

Interpretation of column

Column I: Meets the criteria

Column II: Partially meet the criteria

Column III: Does not meet the criteria

Serial No	Criteria	1	2	3	Remarks
1	Scoring -Adequacy -Clarity -Simplicity				
2	Content -Logical sequence - Adequacy -Relevance				
3	Language -Appropriate -Clarity -Simplicity				
4	Practability -It is easy to score Does it precisely Utility				

Signature Any other suggestion

Name

Designation

Address

APPENDIX-V

LIST OF EXPERTS VALIDATED THE TOOL

1) **Dr.Arumugam, M.D.,D.M**.

Physician, Neurologist,
P.S. Medical Trust Hospital,
Thalakulam.

2) **Dr (Mrs). S. S. Sharmila Jansi Rani,M.Sc (N).,Phd,**
Professor,
Christian College of Nursing,
Neyyoor.
3) **Mrs. C.R. Merlin Suja M.Sc (N),**
Reader,
Christian College Of Nursing,
Marthandam.
4) **Mrs. D.Nesalin Suji M.Sc (N),**
Reader,
Christian College of Nursing,
Marthandam.
5) **Mrs. B. Brightric Joliyo M.Sc (N),**
Assistant professor,
White Memorial College of Nursing,
Attoor.

APPENTIX-VI

QUESTIONNAIRE ON DEMOGRAPHIC VARIABLE

INTRODUCTION

The interviewer is directed to ask the question one by one. According to the response given by the respondent, the interview place a tick in correct option.

SECTION A

DEMOGRAPHIC VARIABLE

1) **Age**
   a. 21-25 years
   b. 26-30 years
   c. Above 30 years
2) **Sex**
   a. Male
   b. Female
3) **Educational status**
   a. GNM
   b. Post B.sc (N)
   c. B.sc (N)

d. M.sc (N)

4) Unit

a. ICU (Intensive Care Unit)
b. General ward
c. Surgical ward
d. Casualty

5) Marital status

a. Married
b. Un Married

6) Clinical Experience

a. Since 6 month
b. Since 1 year
c. Since 3 year
d. 4 years and above

SECTION B

Virginia Modified Back Pain Functional Scale (BPFS)

Measures

Measures	Normal 0	Mild 1	Moderate 2	Severe 3	Very severe 4	Worst pain 5
(1) While doing usual ward activities						
(2) While doing recreational activities						
(3) performing heavy activities around your ward						
(4) While bending or stooping						
(5) Whilewearing your shoes or shocks						
(6) While lifting a patient						
(7) While lying on the bed						
(8) standing for one hour						
(9) walking in the ward						
(10) going up or down by stairs						
(11) sitting for one hour						
(12) travelling for one hour						

Measures	Points
Normal	**0-10**

Mild	**11-20**
Moderate	**21-30**
Severe	**31-40**
Very severe	**41-50**
Worst pain	**51-60**

APPENDIX-VII

STRETCHING EXERCISE

INTRODUCTION

Stretching Exercise isSafe, effective and easy to perform. These exercises, movements and stretches will help you on your path to recovery from back pain. Low back pain is very complex, with many factors and causes. Stretching of the joints, muscles, and nerves are very important to ensure that there are no imbalances throughout the musculoskeletal system. Decreased flexibility in any of these areas may lead to lower back pain. Not all of these stretches may be appropriate for everyone. A stretch should not induce painful symptoms. Rather, a stretch should feel relieving to the lower back and may even help to reduce any symptoms. Our top stretches to minimize back pain

DEFINITION

Exercises that stretch the muscle fibers with the aim to increase muscle-tendon flexibility, improve range of motion or musculo skeletal function, and prevent injuries.

BENEFITS OF STRETCHING EXERCISE

- Increased flexibility and range of motion
- Injury prevention
- Preventing delayed onset Muscle Soreness
- Improved posture
- Improvements in sports performance
- Back pain relief

PROCEDURE

1) **Sitting Pain** (**Seated Lunge)**

- Sit upright with one leg and buttock fully ON the seat and the other leg and buttock suspended OFF of the seat. Keep both knees bent and feet flat.

- With the unsupported leg, slowly slide it to the side and behind you until you are fully stretched out as comfortably as possible. Hold the chair rest or table for stability.

- Try to extend the leg behind you by contracting your thigh muscles and hold this position for 1 minute.

- Repeat this exercise with the other leg.

2)Standing Pain (Deep Squat Rest)

Stand upright with feet shoulder width apart.

- Slowly lower your body to a full squat position while keeping your upper body vertical.
- As you come lower, bring your belly button to your thighs and relax while resting your arms in front. Your knees and legs should be tucked in.

- Rest in this position for 1 minute or until you feel that your stomach and chest are fully resting on your thighs.
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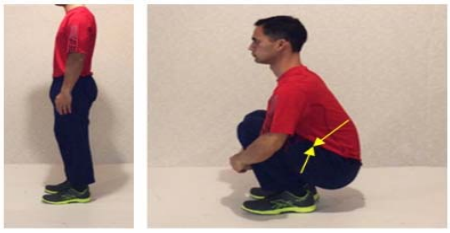


3) Morning Stiffness Standing Hip Shift

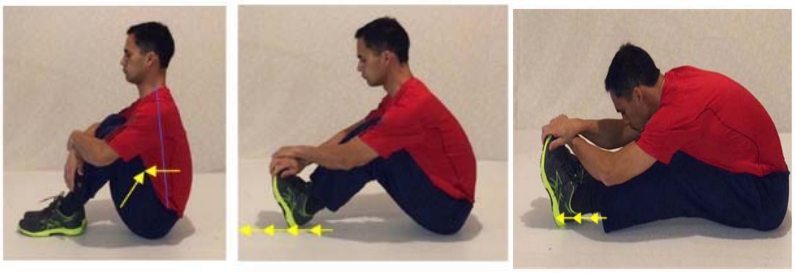
- Stand upright, raise one leg and hold it up unassisted. Allow the unsupported hip to drop.
- Raise the elevated and unsupported side of the hip by flexing the standing hip. Raise in a slow and controlled fashion as high as possible. Your hip should be raised from below the level position to above level.
- Hold the contraction and keep your hip raised for 1-10 seconds.
- Return to a rest position.
- Repeat with the other leg and hip.
- Repeat this entire exercise but now with a forward lean. Contract your abdominals and hold 1- 10 seconds.

4) Back Spasms (Seated Twist)

- Sit comfortably with knees together and upright.
- With one hand beside you, and the other behind you, gently rotate your upper body to the side as far and as comfortably as possible.
- Hold for 1 minute and rest.
- Repeat by twisting in the other direction.
- Repeat often.

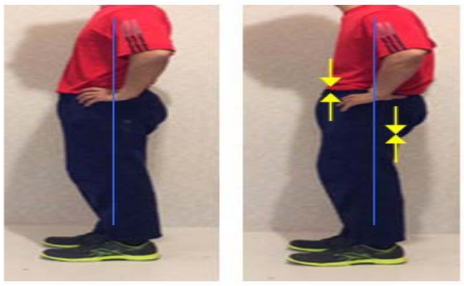
5) Tight Hamstrings (Seated Hamstring Stretch)

- Sit down on a soft carpet for comfort. Keep your back straight and bring your knees to your chest (Deep Squat Rest should be mastered prior to this exercise). Hold them with your arms and bring your belly area firmly against your thighs. Do not move to step 2 unless you are firmly and comfortably maintaining contact between your belly and thighs. Squeeze gently as though you are trying to hold a flat piece of paper in between.
- Hold your feet firmly with both hands. Make sure that you feel that your pelvis and lumbar spine are aligned and engaged with your thighs. Slowly extend your legs out but keep your belly against your thighs. This will preserve your lumbar and pelvic curve together. Maintain a grip on your feet.
- Extend your legs slowly inch by inch and as far and as comfortably as you can. Hold for 1-2 minutes.
- Rest and repeat.



6) Weak Abdominals (Standing Abdominals)

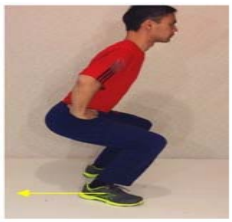
- Stand upright, feet together. Contract the gluteus muscles.
- Contract the abdominal muscles so as to tilt your belly button up towards you while drawing your belly button in toward your spine.
- Hold for 5-10 seconds.
- Repeat often.



7) Weak Gluteal Muscles (Reverse Lunge)

- Lower your hips down into a squat position. Keep your feet shoulder width apart. Your thighs should be just above parallel to the floor. Place your hands on your hips.
- Bring one leg back until the thigh is vertical to the floor. Do not allow your knee to touch the floor. Use your hands on your hips to adjust and maintain your hips level and facing forward. Your back should be straight and upright.
- Hold this position for 1-10 seconds.
- Slowly bring your rear leg to the forward squat position. Keep your thigh parallel to the floor.

- Hold this position for 1-10 seconds.
- Return to a standing position and relax.
- Repeat often.




8) Glute Muscle Pain (Seated Leg to Chest)

- While seated, raise on knee up and bring the inner thigh up toward your chest. Use your hands to carefully assist in rotating the leg inward to your chest.
- Hold for 2 minutes while keeping your back straight.
- Relax back down and repeat with the other leg.
- Repeat often.
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9) Hip Pain (Seated Leg Cross)

- Sit on the floor and maintain an upright posture. Cross your legs.
- Slowly lean forward but begin at the area below the belly button. Lean forward as though you are trying to press this area into your ankles in front of you. Only move as far as you can while maintaining this posture.
- Hold for 1-2 minutes while using your hands to support your forward lean.

CONTRA INDICATIONS

- A bony block limits joint motion
- There was a recent fracture, and bony union is incomplete
- Acute inflammatory or infectious process (heat and swelling) or soft tissue healing.
- Acute pain, A hematoma, trauma, hypermobility
- Shortened soft tissues enable a patient with paralysis or severe muscle weakness to perform specific functional skills